

CALIFORNIA FISH AND GAME

"CONSERVATION OF WILD LIFE THROUGH EDUCATION"

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FISHIN'.

In Some Lakes Near Mount Lassen, Principally, and Trout, Generally.

By ROY E. LUDLUM, Deputy Fish and Game Commissioner.

The district comprising the area of the proposed Lassen National Park has been but little used by the vacationist. Why more people have not taken advantage of trips to this wonderland is possibly explained by its seemingly inaccessibility and lack of publicity. The tourist will find a variety of interests here whether he wishes to hunt, fish, climb mountains, or just camp. This is a summer range of the mule- and black-tail deer; several well stocked lakes as well as the nearby streams will give the angler plenty of opportunity to pit his skill against the trout; numerous mountains in this volcanic region, with their boiling mud springs and ice caves, invite the mountain climber; and camp sites are everywhere.

At present the only automobile roads reaching directly into this proposed National Park are from Chester, Plumas County, to Juniper

Lake, and from Chester to Lee's Camp, Kelley's and Drakesbad, all in Warner Valley, where the tourist may secure meals, lodging and pack outfits for trips to the Mount Lassen district; these accommodations may also be had at Mineral, on the Red Bluff-Chester road.

Going to Juniper Lake, via Chester, by automobile, the tourist will be much impressed with this great body of clear, cold water with its six or seven miles of shore line. With an elevation of 7300 feet, the lake is fed by melting snow and springs, and sloping from its wooded shore it reaches great depths; a single steelhead trout may be seen floating lazily, or a school—sometimes to the number of fifty—may be seen

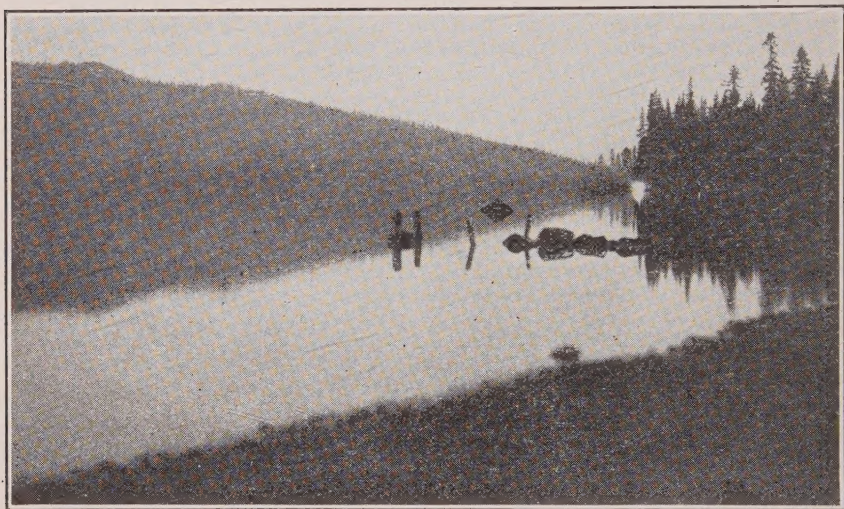


FIG. 77. Moonlight on Juniper Lake, showing reflection of Mount Harkness. Juniper Lake is famous for its steelhead fishing. Photograph by H. R. Basford.

swimming together forty feet under the surface; but going farther out on the lake the bottom is soon lost to view and the depth is left to one's imagination as actual measurements have not been taken.

Juniper Lake was stocked with steelhead trout, in 1915, by the Fish and Game Commission, and the wisdom of this move is best shown by the marvelous development of the fish themselves. Many limits were taken last year, and fine fish they were, weighing up to four pounds. There is a ripple on the water after about 10 o'clock in the morning, but the wind usually dies down before sunset and it is then, as well as in the early morning, that the fly fisherman comes into his own, for the trout come from the depths of the lake to the shallower water in search of the natural insects that fall on the water. A steelhead hooked with light tackle in this clear, cold water will quickly win reputé for his wild rushes and spectacular leaps. The supply of these fish in this lake may be greatly increased by successive larger plantings of fry, but all the fish must be introduced as there are no spawning beds; the number of fish that can live in the lake is only limited by the food supply, and it might be possible to supply, with success, animal or plant matter, or both, as food for the trout.

Juniper Lake offers many camp sites and is a center for the auto camper, as several other lakes and many side trips are within hiking distance. It is reported that a hotel will be built this year, and that more boats and pack horses will be available for hire.

Shadow Lake, a short distance from Juniper Lake, is well named and would appeal to the artist as a study in shadows. A pretty picture it is, surrounded by green trees, its surface dotted with lily pads, together with an occasional sunken log, and a constant change of light and shadow over all. But even the "old-timer," absorbed in his surroundings, may receive a decided surprise, if, as he casually casts his first fly, a half dozen eight-inch rainbow trout rush at his artificial bug bent on its destruction! This lake is small, and like Juniper Lake, has no spawning beds and will require stocking each year. While the season is short yet the rainbows are hardy, scrappy little fellows and Shadow Lake deserves the attention that it would require to keep it replenished.

Grassy Lake is about two miles northwest of Juniper Lake, and about two or three miles farther north is Snag Lake; these two lakes, elevation 7500 feet, surrounded by high timbered mountains are connected by a small creek. Into this creek in May or June of each year comes hundreds of rainbow trout to spawn, and, together with the stocking of the fry supplied by the Fish and Game Commission, the trout have increased until these lakes are of considerable import. While somewhat difficult of access, as they can only be reached by pack train or hiking, the tourist will be well repaid for the effort required to visit the lakes. There are no boats as yet on Snag or Grassy lakes and the fishing must be done from improvised rafts or from the shore, but some of the finest of rainbows up to six pounds have been taken. Snag Lake is second to Juniper Lake in size and Grassy Lake is still smaller, but each seems to be equally well supplied with trout and the fisherman will have rare sport with flies or spinner during July or early August.

Whether or not any fish are caught, a trip to the Cinder Cones at the north end of Snag Lake is worth while and the lava beds and the flow of lava that forms the north shore of the lake are also centers of interest, for they show quite plainly the terrific force of the volcanic action. An action of force has taken place here that is too great for comprehension and the result has been the upheaval of this entire section. After spending a day here, as the tourist returns to Grassy Lake toward evening, he may seat himself on the lake shore, and, looking west toward mysterious Mount Lassen, lose himself in reverie until the great silence of the high mountains gently steals upon him: a profound silence, broken only by the wind in the pines. He may sit thus indefinitely, but when he suddenly arises and shakes off this lethargy the bigness of the out-of-doors has come to him, for he has indeed been close to nature. It matters not to the true sportsman if he has not been able to take a full limit of fish; this fact alone can not spoil his trip for him, and fortunate is the man who can go into the mountains, along the streams and to the lakes and see the wonders of nature and be thankful for his privilege to be among them.

It is a privilege to fish for trout, and added numbers each year are availing themselves of the opportunity to seek the speckled beauties. The rainbow trout, naturally wily and suspicious, has thru his experience with the ever increasing host of anglers reached a degree of

"education" that has gained for him the respect that he merits. It is more difficult to make large catches of trout now than it was a few years ago, not necessarily because the fish are becoming so much scarcer, but because, in the humble opinion of the writer, a greater degree of skill is required to take the fish. But this is as it should be, for better and more delicate tackle is needed and the angler must become more and more proficient in its use; then the life and food and habits of the trout come in for study and a field of pursuit is opened up to the ambitious fisherman that soon becomes a man-sized job. Angling for trout should not be merely "fishin'" with the value of the sport measured alone by the number of fish caught, but in the pursuit and capture of each individual fish when the angler has matched his skill, "fish knowledge" and



FIG. 78. Shadow Lake, a jewel of the Mount Lassen country, stocked with rainbow trout. Photograph by H. R. Basford.

patience against the wary trout, and the fish comes at last to the net, defeated; big indeed is the man who, when his best efforts fail, can admire the trout for his beauty, courage, and cunning.

It is trout fishing that is probably the greatest incentive for taking tourists up into the mountains and if this sport is to be continued it will require much serious consideration and work. Proper legislation giving the fish absolute protection during the spawning season and an increased output from the state fish hatcheries are prime requisites. Each year greater numbers of sportsmen advocate increasing the cost of the angling license to provide more revenue for carrying on the work of propagation, and since it is the angler who must supply this money, who has a greater right to initiate such a movement? Oregon has just increased her angling license fee to \$3, and this added amount will permit the Oregon hatcheries and their output to be increased some 300 per cent. A license fee increased to \$2 or \$3 would enable California to hatch more trout and to give them better protection, but even with increased hatchery facilities the Fish and Game Commission alone cannot make a success of this work without the assistance of the sportsman, for he must help to keep sane laws on the statute books, discourage the fish hog, and cooperate in the enforcement of the fish and game laws.

TIMES HAVE CHANGED.

By J. D. DONDERO, Deputy Fish and Game Commissioner.

As the population of California is increasing by leaps and bounds and the public lands are being taken up, it naturally follows that the open country for our game is becoming smaller and smaller each year. The use of automobiles, high-powered guns, improved highways and the ever-increasing habit of our people to get out of doors, are all important factors that are diminishing our fish and game and command our most serious consideration, as the fish and game of our state belong to the people.

A very large majority of the people obey the fish and game laws of the state and earnestly believe in conservation. When a person kills or destroys game out of season, he not only breaks the law but he actually steals this game from the rest of the people. Conditions have changed greatly in the last twenty-five years. People have been educated to realize the importance of conservation measures and where in the past

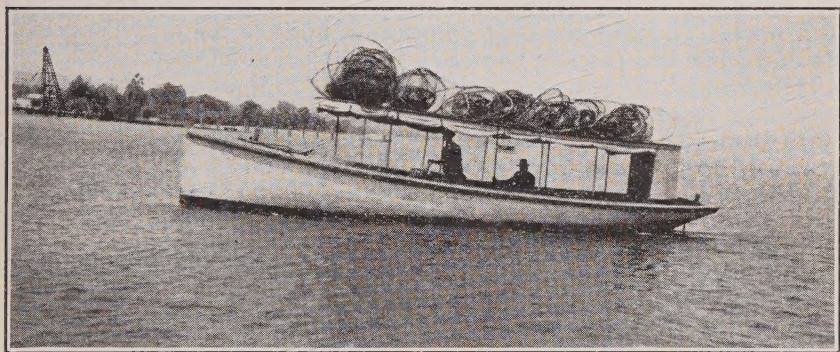


FIG. 79. Launch Freda, used by Fish and Game Commission in patrolling Clear Lake, with load of illegal nets.

violations were treated lightly, I find the more progressive citizens now to be those who respect the fish and game laws.

After a personal survey of the game laws in force in the various states of this country, I find that California has game laws equal to if not better than any in America. We should never advocate any plan tending to commercialize game as this means its destruction.

It is my observation that the deer in this state are holding their own, due in a very great measure to the establishment of game refuges which have been created of late years by the Fish and Game Commission. I believe this to be one of the best achievements accomplished by the Commission, individual and press adverse criticisms to the contrary, notwithstanding. No better plan has been suggested by any of these critics for the conservation of our deer.

The Commission has also been unjustly criticised because certain parts of the game laws are not always evenly applicable to all sections of the state. The Commission has taken great pains to make the game laws and other regulations conflict as little as possible. One can readily see that too many districts with various seasons and laws would necessarily cause a great deal of confusion.

I believe in conservation by education, even having it taught more in our public schools. The great harm done by certain destructions of game should be impressed upon the minds of the young. For instance, the destruction of one female deer means that during a short period of five years, there are thirteen deer less than there would have been otherwise.

For a great many years, it was the custom of the people of this state to hunt in the mountains for the purpose of bringing back a quantity of "jerkey" or dried meat—making a regular slaughterhouse of our hunting grounds. That condition does not exist at this time, thanks to untiring efforts on the part of the Commission. The people of this country who hunt wild game do so nowadays as much for the purpose of getting out-door recreation as to secure meat.

Sporting clubs, gun clubs and protective clubs of various names are being formed all over the country—all with practically the same object in view, that of the conservation of fish and game and to take a more active interest in those matters pertaining to this important subject. The formation of these clubs is a splendid thing and they are doing a good work. They are not only doing good work in the conservation of fish and game but propose necessary legislation, recommend restocking of both fish and game, promote clean sportsmanship and stimulate good-fellowship among men and communities. These clubs are of great assistance to the game wardens in not only apprehending violators, but in greatly diminishing the number of violations. The very existence of these clubs has a splendid moral effect on the would-be law violator. They are not "Squealers' Clubs," as they are sometimes called but when properly functioning serve to *prohibit* violations. To keep game from being wilfully and unlawfully destroyed is worth much more to the people of this state than any prosecutions with their attendant fines, etc., could be after such game has been destroyed.

One of the things that should be discouraged is the raising of hounds for hunting deer. At the time when our bucks are at their prime during the open season, the fawns and young deer need the full protection of their mothers. Ordinarily a hound may run a mother doe a long distance from her young, thereby leaving the little fellows unprotected at night and an easy prey to the skulking coyotes, bob-cats and mountain lions.

If you are a good honest-to-goodness sport, you are the fellow who wants to give your game a fair chance, don't you? Well, try this. When you want to go out hunting deer, next time, take your machine and go to the buck country. Have your camp outfit and a good gun—leave old Fido at home. Get up at break of day, put a sandwich in your pocket, a small canteen of water on your back and light out. Outwit your old buck, and then when the day is over, and later you cast a glance at that noble head resting over your mantle recalling to your mind the thrill of that hunt, you can truthfully say, "I got him on the square."

Times have changed just the same in hunting as other things; the people are realizing more and more that the fish and game belong to the people and it is up to the people to take care of them if we would have any left at all. Remember the territory for hunting is gradually growing less, the army of hunters is rapidly growing larger and the

greatest of care must be used by all to preserve the fish and game. During the great World War, in order to avoid a shortage of sugar, flour, etc., our government placed a limit on these articles and we got through all right. Why not apply the same rule to our fish and game—cut down the limits—kill less—save some for the next year and the year after that and so on. We can get the same old invigorating out-door trip with a smaller bag of game and leave some for the next fellow. The inducements for the out-door trip to thousands of people would be missing if there be no fish or game within their reach.

CONSERVATION THROUGH EDUCATION.

By WALTER B. SELLMER, Deputy Fish and Game Commissioner.

Since the dawn of California's history fish and game have played a picturesque and important part in her adventurous and romantic life. It is to protect from extinction the hundreds of varied species of this wild life which forms such a valuable asset to our great California and at the same time give to the sportsmen the greatest possible measure of liberty that the Fish and Game Commission has assigned its game wardens to various parts of the state.

While it is the duty of the game wardens to apprehend the violator of the state's laws for the protection of game and obtain the evidence to convict him, it should not be forgotten that the prevention of the crime is always to be preferred. The conviction of a violator does not replace the life that has been taken. It is merely a means whereby the



FIG. 80. Searching automobilists for illegal fish and game at Sausalito Ferry, Marin County. Photograph by W. B. Sellmer.

guilty may be punished and a warning to those who would consider the game laws lightly, or the penalties involved in their violation.

The real problem of conservation can therefore be dealt with adequately only when viewed from the standpoint of the prevention of law breaking in regard to the fish and game regulations of the state.

The real game warden does not consider his duty fulfilled when he flashes his star, arrests the violator and confiscates the unlawfully killed game. He realizes that his own efficiency is reflected in the number of violations that take place in his territory, and he endeavors to keep the number down to a minimum.

The price he must pay for this is eternal vigilance. It consists of preaching conservation; of educating the public in his territory what to shoot, when to shoot and how to shoot—or fish, as the case may be—by bringing home to the minds of the sportsmen that the game laws are actually enacted for their good; and by rigid enforcement of the laws so that those who may scoff at these arguments will nevertheless be prevented from breaking the law through fear of arrest and heavy fine.

I have always been a firm believer in conservation through education, in rigid law enforcement with heavy fines for violators, and in the cultivation of public support of the law.

When I took charge of the territory comprising Marin county three years ago the country was badly run down. It was nothing unusual to make several arrests a day. All this meant work for me and plenty of it. During the three years since then I have operated, holding in mind the principles that I have above set forth. And witness the result:

I have gained the confidence of the public and now sometimes as much as a week goes by without a violation taking place.

The game is on the increase. In 1919 there were 215 deer killed. In 1920 the number rose to 250 and in 1921 a grand total of 300 deer were killed in the district.

I was asked the other day how many deputies I had, and I informed the party making the inquiry that there were 1000 storekeepers, ranchers, hotel men and traveling salesmen and that they were all my deputies. By this kind of cooperation I can run down every law violator.

In my opinion the game law violator never succeeds in life and this should form a strong argument for respecting the law. Do you know of a game violator who has ever made a success in life? I don't believe you do and you never will. He never gets ahead because he is always paying penalties, either to a judge or in some other way. The world is against him, including nature herself.

I would like to call to the minds of those engaged in game law enforcement the great assistance I have found in making public through the newspapers the arrests and fines which are imposed. This sets an example to others and I have found this assistance to be invaluable.

WINTER DEER RANGE IN GAME REFUGE ONE D.

By C. O. FITHER, Deputy Fish and Game Commissioner.

Practically all of the deer from the summer ranges on the heads of a portion of Coffee and Swift creeks, all of them from the heads of Stuarts Fork, Canyon, North Fork, and the South Fork of the Salmon, come off of these high granite ranges in the fall of the year and down onto the Trinity river, where most of them range from the first of November until the middle of May. The largest number range in a small section of country along the Trinity river from Junction City to

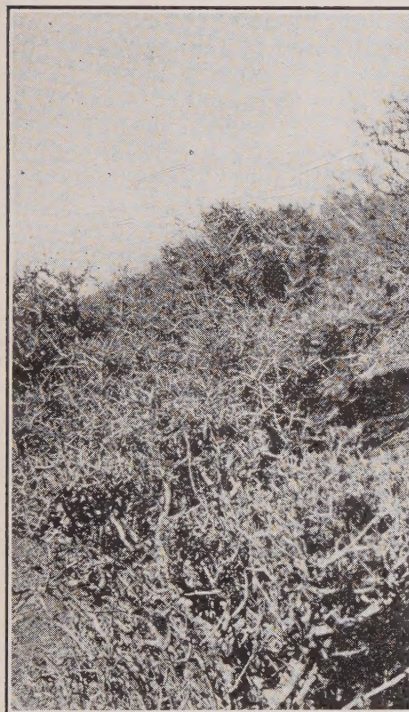


FIG. 81. Appearance of buck brush as result of overstocking of Game Refuge 1D. Photograph by C. O. Fisher.

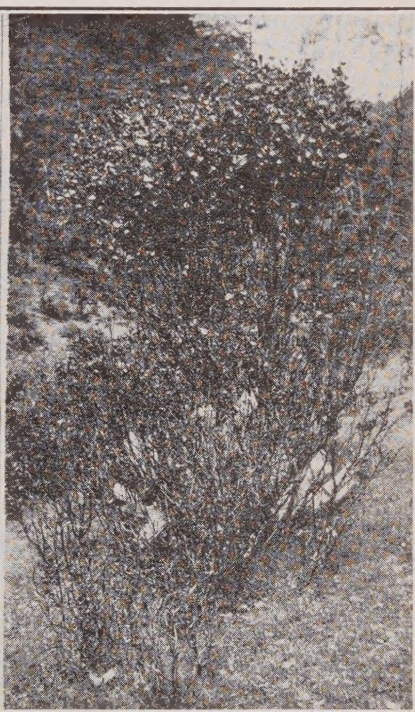


FIG. 82. Manzanita bush in Game Refuge 1D, browsed clean by cattle and deer. It takes starved animals to be interested in manzanita as forage. Photograph by C. O. Fisher.

Taylor's Flat, within game refuge 1 D. The snow in winter drives these deer into a section of country about five or six miles wide and about thirty miles in length, while in the summer they range over a section of country nearly ten times as large as their winter range. Deer have increased in numbers very rapidly in the refuge during the last few years, which complicates the matter of food supply.

This range in the refuge north of the Trinity river is at the present time overstocked with cattle, from which the United States Forest Service receives about 75 cents a head per year for the grazing privilege. During the past two years drift stock have appeared in this section and

a great number of them have been allowed to run there in the winter. The result is that the brush has been stripped of all of the tender tips that cattle and deer must live on during the winter for there is never any grass until the middle and sometimes the last of April. If you were out early in the morning where the deer are feeding in this refuge you could often see deer raise to the hind feet so as to reach a very few young tips from the brush. This scarcity of food has caused deer to eat the coarse brush and in some instances manzanita and madrone leaves which seems to weaken them so that during the last two winters many have died. This last winter in and near this section mentioned between thirty and forty head of cattle died of starvation, showing clearly that there is not enough feed for both deer and cattle.

During the past two years I have purchased at the expense of the Fish and Game Commission nearly a thousand pounds of salt, to use in salting the deer along the Trinity river, where they seem to be effected the most. This salt seems to help them a great deal and they certainly relish it. A standard of two pounds of salt to each head of stock is not lived up to here by the stockmen. The natural salt licks contain a large amount of arsenic which has its effect on them during the spring months. Most of the weak deer stay along the river section. These are the ones that are affected the most, for those that are higher up have a chance to get good browse from the brush when the snows' weight flattens it down so that it is within the deer's reach. They also get a good deal of moss that the snow brings off of the trees when it is melting.

The number of lions are being reduced within the refuge by Bert Higgins and John Abbot, who hunt them at all seasons of the year. These men together kill from twenty to thirty lions every year.

BITS OF HISTORY OF TULARE LAKE FISHING.

By S. L. N. ELLIS, Deputy Fish and Game Commissioner.

Permit me to refer you back some fifty-five years and more to a time when Tulare Lake had an estimated length of sixty-five miles and a width of forty-five miles, with the waters of Kern, Tule, White, Kaweah and Kings rivers all pouring into it. The vast plains of Tulare, Kern and Fresno counties were then a pasture and we had no Kings nor Madera counties. The settlements were confined to "timber belts" and favored spots in the foothills. The very few ditches for irrigation were confined also to the "timber belt" and were short and small and but little water was diverted from the main channels.

Tulare Lake and the streams mentioned were full of native fish and included the common suckers, Sacramento pike, Sacramento perch, "greasers" and several other fish belonging among the bait varieties. The Sacramento perch were usually dubbed "black perch" and the Sacramento pike generally called "lake trout." Few Sacramento perch ever left the lake proper but were found near the mouths of the various streams, where they congregated to get food that the streams carried to them. On the other hand, the suckers, "greasers" and "lake trout" left the lake annually in the spring high waters and travelled upstream for spawning purposes. It was then that the settlers went

fishing and usually armed with a spear that was commonly called a "gig," and hook and line. The Sacramento pike was generally gotten with hook and line baited with frogs, toads or minnows, but the suckers and greasers were taken with the spear. The early settlers were glad to get any of these fish and all were eaten and most thoroughly appreciated, for this was before the introduction of the black bass. The carp, catfish and salmon were then unknown south of the San Joaquin river waters.

I recall two favorable places for the taking of fish in the early days. One at the Dillon Mill, where a trap had been built by the mill operator in the water race which furnished the power to turn the wheels of the old time grist mill. This mill was about four miles from the present town of Exeter and got its water supply from the Kaweah river. The other was the Hard Pan Falls in the St. John's river, near the old townsite called Venice, between Klink and Exeter on the Southern Pacific Railroad. These falls caved in and fell during the flood of 1868 and no visible trace of them remains. Below the falls the fish would congregate in immense numbers and frequently the sight at this stopping place would be similar to looking at a flock of sheep crowded closely together, for the fish could not leap the falls. Many white settlers as well as hundred of Indians came to this place for their fish supply and usually were well rewarded with suckers and "greasers." A few settlers "salted down" a supply for future use while fish were easily gotten.

In the early seventies the "no fence law" was passed and the vast herds of cattle and horses that had grazed the plains were removed to favorable pastures in Arizona and Nevada. Following this came the settler—usually the small grain farmer—who began the opening up of agriculture lines which gave us our present conditions. Immense grain fields they were at first, but gradually cut smaller and smaller into the holdings of today. Immense irrigating canals and ditches were built and all flowing water was diverted from the main channels to supply the orchardist, vineyardist, dairyman and stock raiser. This diversion of water dried up the lower reaches of the streams, which in turn took away the supply of Tulare Lake, with the result that Tulare Lake is today a solid grainfield bounded and cross cut with immense levees and dredged channels. While this change of conditions was going on thousands of tons of fish were destroyed and lost, as there was no market for the common fish; while catfish and perch frequently sold at four cents per pound f. o. b., at some railroad station within shipping range.

Agriculture has claimed and taken away our former fishing conditions and we have but little water left for fish life within reach of the common people.

I have purposely left out trout conditions, for the trout belongs to the tourist and vacationist and not to the man who must do his fishing and return home the same day. There are still hundreds of fishermen who are content to get a mess of carp, pike, or suckers, and nearly any Sunday one can see these fishermen trying the overflow waters of the San Joaquin for the very fish that so many waste and leave on the banks to decay.

We can help these people by returning all fish not really wanted to the water, and by doing this we also relieve the strain on our better grade of fish, for every pound of common fish used relieves the strain on

the higher grades. The coming of the automobiles has added thousands to the ranks of the fishermen and unless we honestly and carefully do all that we can our fish supply will soon pass and fresh water fish will be a thing of the past, so far as the valley is concerned. Within the past decade, the writer has frequently seen discarded small catfish, pike and carp, also shad along the places where fishermen left them to rot. Dressed catfish are now worth 30 or 40 cents a pound in the Fresno markets. Carp sell on the streets at 8 and 10 cents per pound, and I have noticed San Joaquin river shad going east to New York by the car load, where they bring a good price. What excuse can any man have for wasting any of these fish? Now is the time for every fisherman to begin returning every fish not wanted by him to the water immediately, or give it to some one who is glad to get it.

CARELESS DEER HUNTING.

By F. A. BULLARD, Deputy Fish and Game Commissioner.

There should and must be some means of checking the careless hunter who invades our deer ranges and hunting grounds during the open season for taking and killing deer.

Under our present law for hunting and killing deer, there is no excuse at all for any hunter who wants to be law-abiding to shoot a human being or any domestic stock by mistaking them for deer. The law makes it plain that it is unlawful to kill any kind of a deer unless such deer has at least forked horns, and if all hunters will make sure that their deer is a *legal* deer before shooting no accidents will happen. Neither will he kill any does or spotted fawns as is quite often the case. These accidents—as they call them—can be blamed to two classes of hunters: First, the amateur hunter who never killed or hunted deer before, and goes into the woods thinking that everything that moves before him must be a deer. He sees a moving object, or sees the brush shaking, and without waiting to see if it is a deer, and one that would be a legal deer to shoot, he opens fire on it, at the same time so badly



FIG. 83. Doe killed by a careless hunter. The fawns were left to starve. Discovered and photographed by F. A. Bullard.

excited that everything looks like deer and deer horns to him, and only after it is too late to do any good, he finds out that he has shot a man—perhaps his hunting partner—or someone's cow or horse; or if it should chance to be a deer, it is not a legal deer to kill. And then he begins to patch up some hard luck story, of how he saw a big buck run into the brush, and just then this other object showed up and he thought it was the big buck he saw run in there and shot it. Last summer, in and around the General Grant National Park country, there were twelve head of cattle shot and killed, and the year before a like number. There was one man shot and wounded, and several more reported being shot at. And I found many does and fawns that had been shot and left where they fell.

A hunter near Sequoia Lake, Fresno County, shot the doe seen in picture, leaving her where she fell; two poor little fawns were left to starve or be eaten by the coyotes. One instance was called to the writer's attention last summer where a hunter, seeing the brush moving across the canyon from where he stood, took sight at the moving brush and was just in the act of shooting when a man poked his head up out of the brush. This hunter had his gun so near firing that he could scarcely keep from shooting after he discovered that it was a man he was shooting at.

The second class to which accidents may be blamed is what the writer would call the outlaw class. This hunter goes into the hunting grounds with his mind made up that he is going to kill the first deer he sees, buck or doe. He has no respect for the deer law, or any other laws of our country—county, state or national—and will shoot anything he sees if he thinks he is not being watched. Some of this class are good shots and seldom miss the target, and the writer believes them to be responsible for the large number of does and fawns left lying in the woods, merely shooting them to see them fall, and in many cases taking a chance shot in the brush, or taking a shot at long range where it would be impossible to tell a buck from a doe.

Many times I have seen hunters with deer antlers that would barely pass as legal antlers; and in many cases I have heard the hunter boast of what a long shot he made at the deer, where it would have been impossible at more than fifty yards to have seen the branch on the antlers.

As all of our deer ranges are in the mountains and largely in the national forests, the United States Government leases this range to the stock men to range their cattle on during the summer months, that they may market them in the fall of the year; the toll on cattle in these ranges by such hunters is getting to be so heavy that the cattle men can not stand it much longer; and just such hunters are gradually destroying our stock of deer.

FISH AND GAME HISTORY MADE AND IN THE MAKING IN SAN DIEGO COUNTY.

By WEBB TOMS, Deputy Fish and Game Commissioner

It was nineteen years ago the twentieth of July—after returning from the Philippines and receiving an honorable discharge—that I was appointed Deputy Fish and Game Commissioner.

I commenced work with the Commission by patrolling the country on a bicycle. The roads at that time were not much better than trails and it was a hard grind. The next method of travel was by horse and wagon, with the horse "broke to saddle." Then the autos began to come. I got the first "one-seater" coming here, and have had one motoreycle and six autos, and am now using a modern six-cylinder to keep up with the other fellow.



FIG. 84. Rescuing trout from tributary of Cuyamaca Lake, San Diego County, to improve sport in lake.

In this time I have made a little over three hundred cases for violations of our game laws, and lost sixteen of them; and have turned in \$6,500 in fines.

Thirty years ago, before there were any laws on quail hunting, market hunters here shipped quail by the hundreds of dozens at a time. Martinis Chick, who at one time was champion wing shot of California, tells me he has shipped quail by the gunny sack full; and in the territory where he did his hunting there is scarcely a quail to be found. I have seen quail in flocks of five hundred birds and plenty of flocks, where today they are about all gone. San Diego was at one time rated the best quail county in the state. There is plenty of good wild country here but the quail, to survive, must have better protection. The open season should be all of December and a limit of ten birds. In my opinion the roadrunner is the worst enemy of quail.

There have been more band-tailed pigeons in San Diego County this year than for several years past. The oak mast was heavy and there was plenty of feed. The heavy snows of last winter drove the pigeons down to the lower hills where there was a good mast from brush oaks upon which the birds fed. If there is a failure of the mast, the pigeons seem to migrate. Some complaint was made of depredations in grain fields last year.

There were over one hundred deer killed in San Diego County last year. This means extermination. As the law is now, at the opening of the season the bucks are with the does, and every man who hunts deer knows what that means—easy to get a buck and the meat not fit for food. There must be a change in the deer law; the open season should be from August 15th (then they are about out of the velvet) to September 15th, and a limit of one buck. The rest of the deer law is all right.

With a liberal supply of trout furnished by the State Fish and Game Commission, San Diego County has started four trout lakes. Cuyamaca Lake has proved a success, and Lower Otay Lake is furnishing two-pound trout this season, as is also Hodges Lake. Barretts Lake was planted only last year. If these last named lakes are as successful as Cuyamaca Lake, San Diego County in two years more will have some very good lake fishing. The picture with net (Fig. 84) shows the forcing back into Cuyamaca Lake, of trout that have spawned in Cuyamaca Creek. The fish did not seem to get back into the lake as they should, and the day before the opening of the trout season, enthusiastic members of our just organized San Diego Fish and Game Association assembled at the creek and we put the fish in the lake. Over two hundred big trout were saved and put back for the lake fishing. If left in the creek, the fish could have been easily taken.

I have talked with sportsmen from the eastern states and they say there is more game there now than there ever was and that it is increasing. Why? Proper laws. I have talked with sportsmen from all parts of California and they say our game is going fast. I know that applies to San Diego County. California has plenty of game country from one end to the other and should have plenty of game. There should be a Fish and Game Protective Association in every county in the state—this to help the Fish and Game Commission to protect what game we have and to get proper laws through the legislature. If the sportsmen of California expect to have resident game much longer, they must wake up before the next session of our legislature, or it won't be long before they can put their guns away—as far as resident game goes.

THE AUTOMOBILE "CONCEALED WEAPON."

By S. J. CARPENTER, Deputy Fish and Game Commissioner.

We find from year to year, as time goes on, more fishermen and hunters, more automobiles, more roads built into the mountains.

When the fishing season opens, I find that two-thirds of the automobile fishing parties have firearms of some kind, and big enough to kill rabbits, quail, doves, and cripple or kill a deer. Two or three parties who believe in the protection of game, reported to me last spring that they saw deer crippled and found them dead from gun-shot

wounds; also found dove and quail killed by parties riding along the mountain roads in automobiles.

The only thing that can stop this wanton waste and destruction of the game is to pass a law at the next session of the state legislature making it a misdemeanor for any person to have in possession any kind of gun, pistol or fire-arm, of any size caliber, in any closed district.

We have a law at this time prohibiting shooting from automobiles, but it does not stop the violations as it would if it was unlawful to have firearms *in possession* in closed districts. This law would not affect anyone but the game violator and the stock man, and permits could be issued to the stock man and other parties who were deserving. I have looked through many automobiles and found a small-caliber shot gun or .22-caliber rifle in most of them, the excuse given being that they have it along to shoot jackrabbits or to shoot at targets. Often they give no lawful reason for having it, saying "it is too small to kill a deer," and "they just brought it along."

A law prohibiting any kind of firearm in closed districts would naturally cause quite an objection by those who desire to continue the practice referred to, and no doubt a great many people would oppose it; but it is necessary that something be done to check the use of firearms in closed seasons by the fishing and automobile parties who travel in the mountains, from the time the trout season opens until the deer season closes.

I have noticed, traveling along any of the roads where we have quail and deer, that before the trout season opens the game is very gentle and pays scarcely any attention to automobiles, but a very few days after the trout season opens they are not to be seen, unless it is a crippled one, too sick to get out of sight.

The reader may say, "why don't the wardens catch these violators?" To apprehend all of these violators, with the number of machines on the road at this season of the year, is almost impossible, and, too, if the officer was not on the spot at the time of the violation he can do nothing. In this last statement can be seen one objection to the small-bore gun—it does not make noise enough to be heard a very long distance, and the violator knows there is slight chance of the sound reaching the ear of a game warden.

I think every true sportsman will agree with me as to the soundness of this argument for the enactment of a measure that will do away with this particular form of violation of our game laws.

TROUT CONSERVATION.

By D. E. ROBERTS, Deputy Fish and Game Commissioner.

The matter of keeping the trout streams of California stocked to withstand the heavy drain they are now and will be subjected to, is becoming a serious matter with the fishing fraternity.

There is no question that the increasing number of automobiles, from year to year, which necessarily means an increase in the number of fishermen and fisherwomen, is the main reason for the heavy toll on trout as well as game.

Dry years and increased irrigation causes the drying up of small tributaries and gulehes, which results in a considerable loss in spite of the efforts of wardens and public spirited citizens to save as many as they can by transferring the fish to living waters.

While I personally prefer fly fishing, I do not object to bait fishing, but I do object to the size of the hooks used. I believe salmon eggs should, and some day will, be prohibited. Their use almost necessarily means using a small hook, which a very small trout—often not more than three inches in length—can easily take. Whether small trout are like growing children, always hungry, it is a well known fact to any trout fisherman that the small fry are always ready for anything that looks good to eat, while the larger ones are laying off between meals. A limit of twenty-five, caught on many of our streams, with salmon eggs, would not make a meal for one hungry man, while on the same stream, the same number caught on a fly, (especially if you do not use a midget), or angle worms, or grub worms, would average much better. Some fishermen will contend they take the smaller ones off and put them back in the stream. Granted, but the way I have seen a good many take them off, they had better keep them or kill them and be done.

What we would lose one season by leaving many of the small fry to go over, would return us two-fold next year. I do not wish to be understood as criticising any particular kind of bait or fisherman, except as to the extent and method of taking the fingerlings.

A due regard for present sport, as well as for those who will be coming after, is necessary. A day astream with a dozen or two fair sized trout is more satisfaction than a limit of small ones; and the satisfaction in the knowledge that there are plenty left for yourself or some one else at a future trip should appeal to every true sportsman.



FIG. 85. Deputy D. E. Roberts patrolling Tuolumne County.

GAME CONSERVATION IN TRINITY COUNTY.

By G. O. LAWS, Deputy Fish and Game Commissioner.

The major part of Trinity County is enclosed within the national forests, including Fish and Game District 1 D, commonly known as Goat Mountain. This shelter was created in 1915, the result of a petition from the people of Trinity County, addressed to Frank M. Newbert, president of the California Fish and Game Commission, and presented by him to the state legislature for ratification. In circulating the petition, five only refused to sign it, showing that the people in general favored conservation. Of course the refuge was considered an imposition by many who were anxious to kill deer in and out of season, but sentiment has now changed among this class to such an extent that many are now requesting that a second refuge be established or that this one be enlarged. People have awakened to the fact that enforcement of the game laws is not oppression but simply conservation.

At no time has the shelter been seriously encroached upon by violators, and during the hunting and fire seasons, July 1 to November 1, it is strongly guarded. The lookouts on Bally Mountain report immediately to the nearest ranger or the main office at Weaverville, every shot that comes to their hearing. Trinity County has eleven regular deputies the year round: two state and nine forest officials and thirty four-months deputies, making forty-one during the hunting and fire season.

The relation between the forest officials and the fish and game deputies has always been most cordial and this cooperation greatly aids in law enforcement.

While the law governing 1 D is stringent, it deals without favor to anyone. Permits to carry firearms through the shelter, on public roads, must be obtained; also permits to trap fur-bearing animals. First a license, then a permit, if application is approved. Deer meat transported through, must be certified to before a notary public, as all game shelters are classified as closed districts.

The predatory animal hunters of 1 D are John Abbot of Hayfork and Bert Higgins of Helena. They are restricted to panthers, bobcats and coyotes, many of these animals being caught by them each year. No bear are allowed killed at any time within the limits of the refuge.

Salting deer on Bally Mountain, 7000 feet above sea level, has been tried out for the past five years. An increase in the number of deer around the salt logs has been apparent as a result of canvass taken.

Cattle and horses are allowed to graze in 1 D. Close observation shows that, as it stands now, feed conditions toward fall are not enough for all, and if it could be done, game shelters should be what the name implies—for wild animal life only. Deer require different kinds of feed during different seasons of the year; they eat a little grain in the early spring, but are a browsing animal and dainty in their habits. In browsing they pick each leaf separately and contents of stomach shows very few twigs. Deer use their lips for leaf gathering, while cattle use their tongues, and horses bite directly with their teeth.

This refuge is getting to be a show place and the residents of this county are proud of it. The state highway from Helena to Big Bar is inside the refuge and hundreds of deer gather in this section for the

winter—in fact, many stay there the year round. Tourists are referred there for pictures and for close range observation—for deer are here to be seen feeding in a natural state, without fear of man.

Among other attractions is a mighty black bear with a white face, and as far as we know, he has for the last four years taken good care to live inside the lines and not far from his cave. People who have seen him say he will dress 700 or 800 pounds. Two white deer also make their home here. The high altitude of parts of the shelter makes it an ideal summer home for animals, the low portions along the Trinity and Hayfork rivers furnish a winter range. Hundreds of mountain quail nest around the lookout station and bushy hillsides.

Composing as large an area of brush and timber lands as it does, only four fires—one incendiary, two from electric storms and one from power lines—have occurred since the shelter was set aside in 1915. This shows when no camping by hunters is allowed, fires are certainly less.

Conservation of game does not mean what many seem to think it does. The game and fish belonging to the people—you, me and everybody. Not to one individual or favored class, as certain people would have you believe. The Fish and Game Commission simply enforces the laws made by the people through their representatives in the legislature, and the wardens must follow the law and instructions as entered in the statute books.

In District No. 1, two deer are allowed to anyone under certain conditions, for the sum of \$1.00, and if put on a money basis, the deer should be worth \$30.00. On the other hand, for recreation, health and sport no valuation can be placed. Tourists, campers, and all good sports are welcome to Trinity's fishing, hunting and recreation grounds for pure water, health and sport.

SEEKING EVIDENCE.

By M. S. CLARK, Deputy Fish and Game Commissioner

In my duties as a deputy of the Fish and Game Commission, I have found it necessary to deviate a little from my fixed rule of operation, in order to catch some wilful violator of the fish and game laws. That rule is never to place myself in a position of encouraging violations, such as talking of violations in a trivial manner when not known to the party addressed, or otherwise encouraging a man to go out and violate a law in order that I may arrest him. But I assisted in "pulling off" one trap which, I think, was justifiable, as the man we were after was a notorious violator.

Some five or six years ago we received a letter from Deputy Bert Miller, at Ukiah, informing us that there was 200 or 300 pounds of dried deer meat at Boonville for sale, and that he thought if we would send a strange man up there, he could arrange to get him in touch with the parties who had this meat for sale. Mr. Hunter, our assistant executive officer, thought I could fill the bill, so I arrived at Ukiah the next morning and went to a livery stable and hired a team of horses and a buggy for the trip to Boonville.

I had been over the road numerous times, but in order to trap our man I was compelled to play the part of a total stranger, anxious to look at a ranch for sale near Boonville; also to get a certain man to drive me

over and introduce me to the parties who had the dried meat. Mr. Miller had arranged for this certain man to be in or near the stable when I came in to hire the rig. I informed the stable man that I would have to have a driver as I was not acquainted. He turned to this man and, addressing him as "Less," asked him if he could go with me. He said: "sure."

We got under way. As we passed the Hotel Cecil, I saw Mr. Miller standing on the sidewalk with a broad smile on his face, "sizing" us up. This man "Less" started in by telling me his life's history, which did not interest me at all; so, when we got into the timber and hilly country, I started him on the subject nearest to my heart by asking him if there were any deer in the locality. He informed me that he had killed nine deer the year previous, which did me no good, as, if I had brought him up on his own statement, he would have acknowledged himself to be a liar. He informed me that there were two brothers at Boonville with some dried deer meat, which could be bought, just the information which I expected to get from him.

As we arrived in town, "Less" spied one of the brothers on the street. He stopped the rig and introduced me to the man and asked him for some of the jerkie. This brother informed us that he had sold the meat the day before to a party at Napa but would try to get some meat from a friend of his and would let us know that evening. We journeyed out to look over the ranch I was supposed to buy, and later called on a cousin of "Less's." I remained in the rig and "Less" went in the house to see the cousin, who was in bed with a broken leg.

"Less" came out in about thirty minutes, placed a small package on the seat and we drove back to Boonville. On arriving at the hotel, "Less" took the package in and came out again. We put the team away for the night, and went into the dining room for supper. We were served with two beautiful steaks of the choicest part of a deer. I began to think very rapidly. To take him in would be to spoil the purchase of the dried meat, for which I made the trip. If we ate the meat, the evidence for a conviction on "Less" later would be gone. So I took a gambler's chance and ate the meat, which was delicious. After we had finished, "Less" turned over a small bone on his plate and said, "If there is a game warden in the country who can tell that is a deer bone, I eat my hat." "The best laid plans of mice and men go astray," so when we met our party that evening, he informed us that he could not get any more dried deer meat.

On our return to Ukiah, I informed deputies Miller and Lea of what transpired. They got a search warrant and went to Boonville; got some deer meat from "Less's" cousin, fined him and found out when he had broken his leg.

He had killed this particular deer on the range and in putting it on his horse to bring it in, the horse got frightened and jumped, breaking the man's leg. Quite an expensive deer, I think. In the meantime, we got in touch on the telephone with deputy W. J. Moore, at Napa, who searched the house of the parties who had bought the dried jerkie at Boonville. He failed to find any evidence to convict.

A PATROLMAN'S VIEWS ON CONSERVATION.

By J. L. BUNDOCK, Deputy Fish and Game Commissioner.

In considering the conservation of wild game of our state from the viewpoint of a patrolman, I will take first the bunnies—both cottontail and brush rabbits. These innocent little animals come in for condemnation, for crop failures, and, in fact, for about everything that can not be blamed on something else.

I remember being called to Morago Valley to see the "great damage" that the rabbits had done to a farmer's crop. "Completely ruined" was his complaint. He took me over the field, pointing out the damage done. This is what I saw: One side of his field was bordered with a heavy growth of wild blackberries and poison oak, as well as other brush. For a space of ten or twelve feet there was no sign of grain. What else could you expect? The life of the soil was drawn to the wild brush. I asked to be shown where the rabbits had eaten the grain. He could not show me. I could see no sign of any grain ever having been planted there.

The chief desire of this farmer seemed to be to have a permit to shoot the "bunnies," so that he might invite his "city friends" out for a day's sport.

It is no uncommon request that we deputies receive, to secure permits for farmers to shoot rabbits out of season, claiming great damage is being done. The real reason for the request seems to be, not the damage being done, but a desire to break the law and entertain their friends—with the consent of the Commission.

The rabbits do eat a few vegetables—but why be so hard on them? Do they not have to have food in order to raise their young?

The quail, too, comes in for its share of imaginary damages. I have heard farmers (strange as it may seem) claim that they had "gone broke" on account of the ravages of the quail! Never is the reason given that it is their own poor management.

The deer is not exempt from these "calamity howlers," yet how often do we find the deer coming into the valleys—unless a very severe winter has forced them down from their mountain retreat.

One can readily see how long the game would last, were all requests for permits granted, not considering the vast tollage taken by the persistent violator.

I would advocate heavier fines for a first offense, with the second offense bringing a jail sentence, as the best means of conserving our game.

THE CONSERVATION OF DEER.

By HARRY N. BRITTAN, Deputy Fish and Game Commissioner.

During my three years' service in the employ of the California Fish and Game Commission, most of my work has been in the mountains comprising western Colusa, Glenn, Tehama, northern Lake and southern Mendocino counties, where the deer comprise our most numerous and noted game; and I can notice, from year to year, that the deer are increasing in most localities.

I have had the opportunity to talk with old settlers in some sections of the country where deer winter, and they tell me that some twenty

years ago, on these winter ranges, they had a hard time to kill meat enough to eat, and now, on those same ranges, during the winter one may see the deer grazing in countless herds.

This increase is due to the long, hard work of the Fish and Game Commission and its deputies.

The noted hide hunters that devastated our ranges of the buffalo, elk, and antelope were fast destroying our deer in the same manner, but now, through the strenuous efforts of untiring officers of the Commission, those days are gone.

I believe at this time the most dreaded enemy of the deer is the California lion, which thrives principally on them, but is being hunted hard by men with trained dogs and also by trappers. There have been some fifteen lions killed this last winter and spring on the east slope of the Summit Range in this section.

The coyote, also, is very destructive to the deer in the spring of the year, when the fawns are small; and in the winter, when the deer get very poor, they are an easy prey for either the coyote or wild cat. There have been about one hundred coyotes caught in this section this year, and wild cats too numerous to mention.

But now, with the acreage in the mountains that has been turned into game refuges, and the protection that the United States Forest Service is giving in stopping the burning of brush which affords a cover for the deer, they are bound to increase and the next generation to come is to enjoy the same pleasure that we do in hunting this wonderful animal when the season of the law allows.

But the last and most insidious enemy of the deer in the estimation of the deputy, is the nimrod who is classed as a doe-killer. What manner of man is he who, allowed the freedom of this great field of pleasure, will wilfully go out and shoot down an old doe, and leave the little children of nature to starve, and go on his way, rejoicing to think that some deputy did not see him commit this cowardly act; or, maybe, he will go into camp and tell his comrades about seeing no bucks but lots of does and fawn, but never mention what he did; or perhaps his conversation will lead on to the game wardens and he will tell what he would do if he met one out some place alone; and maybe, by chance, he will meet one, and that violator—how quickly he will change, and he is so sheepish and scared that he can hardly tell his own name or find his license when the deputy asks him for it. The game wardens are always glad to break up the hunting party if need be and drag to justice this kind of man.

THE EASTERN BULLFROG IN CALIFORNIA.

By TRACY I. STORER.

(Contribution from the Museum of Vertebrate Zoology of the University of California.)

The importation and acclimatization of species of plants and animals in lands where they are not native is a subject which has claimed the attention of naturalists and others for a great many years. The colonization of new regions by people from the older long established countries of the earth has almost invariably been followed by efforts to introduce homeland species into the new territory. A notable history of such efforts in respect to one colonial area has just been published* and should be read by everyone interested in the subject. Such introductions in all lands have been mainly of species desirable for food or sport or thought to be useful in some phase of agriculture. Mammals, birds, fishes and plants have consequently been the forms most extensively exploited, though scarcely any group of animal or plant life has escaped attention in this connection. It is desirable, for purposes of future study, to record as accurately as possible the history of each experiment, whatever the outcome, whether or not the species gains a hold in its new location and whether it turns out to be beneficial or harmful to man's interests. And in the case of successful introductions the subsequent progress of the transplant should be recorded. It is with these various points in mind that the following admittedly fragmentary account of the introduction of the bullfrog into California is offered.

On July 12, 1922, Mr. Franc Thiel of Mission San Jose brought to the Museum of Vertebrate Zoology two adult frogs and four very large live tadpoles which he had secured in Sonoma Creek near El Verano, Sonoma County, California. Other frogs of the same species had been caught for food in the same vicinity during the current season. These, according to reports furnished Mr. Thiel by local residents, were "French frogs" (which, however, is the local name, throughout California, for any frog suitably large enough to be used as food) and had come from a stock "brought from France" some years previously, and introduced into a nearby reservoir. The reservoir had overflowed one winter and the frogs (or tadpoles) became distributed over the surrounding country where they are now living and thriving in numbers. Some boys who visited Boyes Hot Springs in late July this year told the writer of seeing many very big tadpoles which were then "changing into frogs."

The frogs and tadpoles proved not to be "French frogs" but the common bullfrog (*Rana catesbeiana*) of eastern North America. The adults are comparable in all respects with descriptions and with an adult specimen at hand from New Jersey. The tadpoles far exceeded in size those of any of our native California frogs. One specimen of the latter measured 135 mm. ($5\frac{3}{8}$ inches) in total length. The "tooth pattern" agrees with that shown for the larva of the bullfrog by Wright in his monograph on the Anura of Ithaca, New York (Carnegie Inst. publ. no. 197, 1914, pl. VIII). All of the big tadpoles had the webs and toes of

*The Naturalization of animals and plants in New Zealand. By Hon. George M. Thomson (Cambridge, at the University Press), 1922. x+1—607 pp.

the hind legs well developed and agreed with the form and size of the "two-year old" tadpole of the bullfrog in the eastern states. One of these tadpoles was kept alive by the writer in an outdoor aquarium; by August 21 it had well developed front legs; by September 7 it had completed its metamorphosis.

The writer visited Sonoma Valley on August 27, 1922, and found good and abundant evidence relating to the bullfrog. In pools along the course of Sonoma Creek opposite Agua Caliente tadpoles of this species were found in considerable numbers. These were of three distinct sizes. The largest measured about $5\frac{1}{4}$ inches in length. All had hind legs fully developed and the front legs had either appeared or were about to appear. These larvae would have changed into frogs within a few weeks at the longest. The second category comprised tadpoles about 2 inches in total length. These, although larger than the fully grown tadpoles of our native creek frog (*Rana boylei*) had no evidences of hind legs. The coloration of these two lots of tadpoles was essentially similar, an olive green upper surface marked with fine black dots and a whitish under surface with little or no iridescence. The third size consisted of tadpoles $\frac{1}{2}$ to $\frac{5}{8}$ inch in length. These were mostly black, with scattered yellow markings and with an angular bar of yellow crossing the back just behind the eyes. These three sizes of tadpoles correspond to the descriptions given by Wright (tom. cit., pp. 83-85) for the two-year old, one-year old and newly hatched tadpole of the bullfrog in the eastern states. Presumably they represent egg masses deposited in Sonoma Creek in 1920, 1921 and 1922, respectively.

Local informants told the writer that a stock of frogs had originally been brought in by Mr. Rudolph Spreckels and placed in a reservoir on his country place which is on the east slope of Sonoma Mountain above Sonoma Valley. A letter of inquiry to Mr. Spreckels brought the following information. In September, 1914, and June, 1915, he purchased from H. Goodman and Co., 400-414 Poydras Street, New Orleans, La., eleven dozen "Jumbo Frogs." Also in September, 1914, one dozen large frogs were purchased from C. W. Coombes, a frog merchant of South San Francisco, making a total purchase of twelve dozen frogs. These were all planted in a small lake on his place. This lake or reservoir was emptied during November, 1917, and frogs and tadpoles were allowed to run out a pipe leading from the lake. "Thousands of polly-wogs" are said to have gone into a small creek nearby. This creek leads down the slope of the mountain and joins Sonoma Creek. When seen by the writer on August 27, 1922, the creek was entirely dry, but like other intermittent creeks of the California foothills it doubtless carries a considerable volume of water during the winter months. From the stock carried down in 1917 has come the present population of Sonoma Creek.

A heavy drain is evidently already being laid on the frog population of Sonoma Creek for only two adults were noted by the writer in the several pools examined. Ordinarily the shores of water where frogs have recently metamorphosed are lined with young individuals, but such was not the case here. The explanation lies in the fact that already many persons have become aware of the presence of sizeable frogs in Sonoma Creek and the animals are being hunted for food. One resident

of the region had on his gatepost a sign "French frogs for sale." Upon inquiring about his supply I was shown two crudely constructed enclosures with small pools of water. In one of these there were about six large adult male bullfrogs (one of these was 7 inches in body length), while the other pen held about 300 recently metamorphosed individuals of the same species. These had been captured by two boys along the creek and an attempt was being made to "raise" the small frogs for market.

Upon relating the first part of this account to Mr. Edmund Jaeger of Riverside, and showing some of the material to him, he informed me that some of his high school students in biology had this year (1922) brought in some tadpoles of the same caliber. Upon his advice I wrote to one of his students, John Goheen, and shortly obtained three more living specimens of the bullfrog. The frogs in this southern California locality are to be found in a reservoir known as "Mockingbird Lake," situated southeast of the city of Riverside at the mouth of Mockingbird Canyon. There are frogs also in the Gage Canal which skirts the base of the foothills back of Riverside.

Mr. Jaeger stated further that in 1914 when he was a student at the Loma Linda College of Medical Evangelists his instructor in physiology, Dr. A. W. Truman, had on hand some frogs which had been imported from the eastern states. Correspondence with Dr. Truman elicited the fact that he had obtained a large number of frogs from Illinois and some from Louisiana during his years at Loma Linda. Mr. Jaeger stated that the stock of frogs was kept in a cement bottomed lath house on the grounds of the college. The people in the neighborhood complained of the loud noises which the frogs made. [This is indicative of the stock having been bullfrogs. Our local native species of frogs, and the frogs other than the bullfrog which are commonly imported into California for physiological work, are all rather weak voiced.—T. I. S.] The Gage Canal runs directly below the college site and thence for about seventeen miles along the foothills and crosses the mouth of Mockingbird Canyon. Mr. Jaeger makes the suggestion that some frogs from the above-mentioned enclosure probably escaped and made their way into the canal. These adults or some of their tadpoles were then carried down to the vicinity of Mockingbird Lake. In 1922 the school children at Riverside knew of tadpoles "which took two years to change into frogs," so the species must have been established there by 1920 if not earlier.

Still a third occurrence for the species within the state has come to the writer's attention. Mr. Richard Hunt of the Museum's staff recently told me that on April 25, 1920, he had heard "eastern bullfrogs" in Searsville Lake back of Stanford University. Correspondence with Professor G. F. Ferris of the Stanford faculty elicited the further information that the same heavy voices had been heard there by him. Professor J. O. Snyder wrote that some "very large tadpoles" had recently appeared in Lagunita, a smaller lake directly on the Stanford campus.

"Bullfrogs" of unknown species are established in Little Lake, Inyo County, southeast of the Sierra Nevada. These are stated to have been "brought over from France." Verbal descriptions of these frogs were given to Dr. Joseph Grinnell and Mr. Richard Hunt in 1918 and again



FIG. 86. Eastern Bullfrog. (*Rana catesbeiana* Shaw.) Adult male from El Verano, Sonoma County, California, two-thirds natural size.

to Dr. Grinnell in 1922 by Mr. W. W. Bramlette who owns most of the land around the lake. The reported size of the animals, the strength of their voices, and the nature of the egg mass suggest that the eastern bullfrog is the species in question; but efforts to secure material for accurate identification have as yet been unavailing. This introduction is believed to have been made about 1915 or 1917.

The accompanying illustration gives a good idea of the appearance of the adult bullfrog. The companion picture is that of our largest

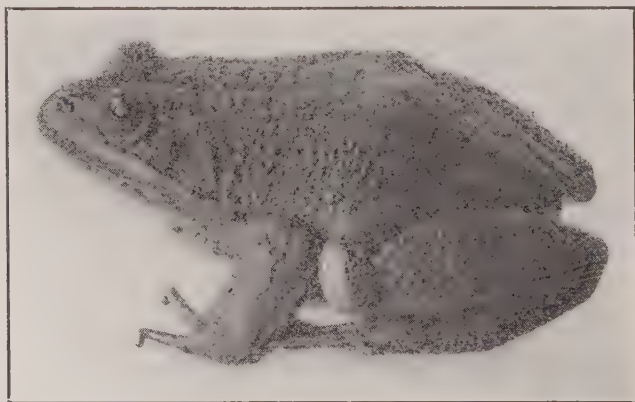


FIG. 87. California Red-legged Frog. (*Rana aurora draytonii* Baird and Girard.) Adult female from near Berkeley, California. Two-thirds natural size.

native frog, the California red-legged frog. Both are figured two-thirds natural size. The outstanding features by which the bullfrog may be distinguished from this and any of our other native frogs are the following:

1. Ear membrane conspicuous, equal to (females) or exceeding (males) the eye in diameter.

2. Low rounded ridge bounds the upper and hinder margins of ear membrane.

3. Back relatively smooth, no large "warts," and no lengthwise folds or ridges of skin.

4. General coloration above dark greenish olive, irregularly and obscurely marked with dark brown; under surface white, sometimes slightly mottled with yellow. No reddish coloration on body or legs.

5. Fourth toe of hind foot webbed clear to tip.

The features by which the tadpoles can be recognized are indicated briefly above, in the description of the material collected by the writer in Sonoma Valley.

The bullfrog is the largest species of North American frog. Old adults, according to Wright (Bureau of Fisheries document No. 888, 1920) may reach a length (head and body) of 8 inches. The present writer has seen a number of California specimens which measured over 6 inches and one which was 7 inches in length. At the time of changing from the tadpole stage into the adult form, the animal measures about 2 inches in length. This is larger than with any of our native frogs at metamorphosis, so far as known. After the two years in the larval stage the bullfrog (according to Wright, 1920, p. 37) requires four years to reach a length of about 4½ inches; old adults of 7 or 8 inches in length probably require 7 or 8 years to attain such a size.

The native range of the eastern bullfrog extends from the Gulf coast to southern Canada, and from the Atlantic coast westward to the margin of the great plains. In this wide area considerable differences in climatic conditions are experienced, and this may be taken to indicate a considerable degree of adaptability on the part of the species. However, there is one essential requirement of the bullfrog, and that is permanent water. The two year development history of the larvae requires this. The adults are highly aquatic, never going far out on land and spending much of their time actually in the water. In their native haunts, sheltered pools of water containing stumps and brush, as for example old mill ponds, are favored by the frogs, though they live to some extent also along sluggish streams. Here in the west, water reservoirs and the deeper permanent pools of our foothill streams afford suitable environment.

The future history of the bullfrog in California will be watched with interest; the evident success of the transplants here described will doubtless lead to attempts to introduce the species into other localities in the state. Such efforts would be likely to meet with success, provided the attempt is made with due regard to the requirements of the species. The writer would be glad to be informed of any such transplants.

The bullfrog in its eastern haunts is known to partake of a wide variety of living things as food, including small frogs of its own or other species, tadpoles, small fish, insects, worms and at times even small

birds. Introduced into suitable waters here, it would probably levy toll on the several classes of animals just indicated. But what effect such transplants may have on the local fauna can not be forseen.

The preceding account may possibly fire some reader to think of establishing a "frog farm" and in anticipation of this the writer would give a few words of caution. There are difficulties aside from those mentioned in the frog story told by Owen Wister's "Virginian." The rearing of tadpoles is readily accomplished in a pond suitably stocked with aquatic plants, as the larvae live and grow on a vegetable diet. But when the tadpoles change into frogs their food habits also change. Thenceforth they take only living animal food. The problem of the "frog farmer" is to supply this food. Thus far no successful means of providing the necessary food has been developed. On one "frog farm" of which the writer has heard the cannibalistic tendencies of the adults were indulged to a limited extent and this provided the food necessary for growth. The larger frogs were allowed to eat some of the smaller ones and some of the tadpoles. But a general segregation in size had to be made in order to keep the stock from becoming solely of adult frogs.

Berkeley, California, September 18, 1922.

CALIFORNIA FISH AND GAME

A publication devoted to the conservation of wild life and published quarterly by the California State Fish and Game Commission.

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All material for publication should be sent to H. C. Bryant, Museum of Vertebrate Zoology, Berkeley, Cal.

NOVEMBER 10, 1922.

A DEPUTIES' NUMBER.

The administration of fish and game resources is largely in the hands of deputies of the Fish and Game Commission, who are locally known as game wardens. These men are held responsible for law enforcement, fish planting, educational work and all matters pertaining to their particular district. There are approximately seventy such deputies in the state. As a rule the warden is known to the average citizen as an officer of the law only. That readers of the CALIFORNIA FISH AND GAME may have a better insight as to the attitude of mind held by these faithful servants of the state, we offer herewith a deputies' number, the contents of which is largely made up of articles and editorials submitted by the various deputies. A perusal of these articles should convince the most skeptical that the men who have been chosen for this sort of work have the right attitude on conservation matters, are sincere, have their work at heart, and are performing a splendid service. It should be remembered that these men are always on duty and frequently work both day and night. Salaries paid them are not large and their chief reward is in the knowledge that they are working to prevent the extermination of a great resource.

If you are a true sportsman and conservationist you will find in your game warden a friend; if you are a violator of fish and game laws, he is rightly your antagonist. We are hoping that this number will interest you in the game warden in your county, and that you will be led to respect the admirable qualities which make him an efficient warden.

THE DEPUTY OF THE FISH AND GAME COMMISSION.

The deputy of the Fish and Game Commission is your humble servant. He is deputized to enforce the fish and game laws and protect your interests in the sport of hunting and fishing. Cooperate with him; lend him a helping hand in making known to him cases where violations of fish and game laws are taking place. The cooperation of the sportsman with the deputies of the Fish and Game Commission will make the cause of protection of fish and game a grand success, and build up for you and your children that sport which you and your forefathers have enjoyed.

The Fish and Game Commission is endeavoring to teach the public to protect its fish and game assets by education, through its deputies, through motion pictures of wild life, CALIFORNIA FISH AND GAME, and publications of various sorts, all of which is bringing the people who fish and hunt closer to the Commission and the ultimate aim—suitable protection of fish and game.

A great many things have been brought to bear upon the condition and protection of our wild life: Civilization has come in. Lands have been settled. Nesting places and spawning ground for fish have been removed. The birds and wild game have moved back. The saw mills, with their modern machinery and logging equipment, have laid waste and destroyed acre upon acre of forest, once the natural protection and home of the birds and wild animals. Irrigating ditches and dams have destroyed the spawning grounds for fish, or stopped their progress up the streams. Not until the Fish and Game Commission recommended laws compelling property owners to screen irrigation ditches from the main stream, were the fish protected and not used for fertilizer in the fields. The laws also compel owners of dams to provide fishways, or ladders, in runarounds around dams, so that the fish can get up over dams to head waters to spawn. All of this is done to protect the people's pastime, the sport of fishing and hunting. In all of this work the deputy plays an important part for it is up to him to furnish the proper information.

Because the deputy asks you for your name and the number of your license, don't think that he is too officious—that he should show you how to catch fish, furnish you with bait or hook *in fashion*, or lead you to a good fishing stream or pool. His duty is to check up licenses and

limits, and see that there are no infractions of fish and game laws. A fair, gentlemanly question is always answered in like manner by deputies of Fish and Game Commission.

Treat the deputy of the Fish and Game Commission as you would like to be treated. Don't brand him as a game violator—or game hog, simply because you hate a man who carries a star and is empowered to enforce the law. Meet the deputy on an equal footing as any other man with whom you come in contact. Be gentlemanly and the deputy will return to you the same respect. The Fish and Game Commission endeavors to have manly men to enforce the laws of the Commission, and when a deputy is found otherwise, the Commission declares a vacancy.—JOS. H. SANDERS.

LEGISLATION NEEDED TO PROHIBIT USE OF LONG GUNS.

In the past few years the use of what is termed the "long gun," has been increasing in the duck marshes of the Sacramento Valley, where some men are still trying to make a precarious living by hunting for the market. The "long gun" is an automatic with an extension chamber, allowing the rapid firing of ten shots; in other words, it is a small machine gun. Naturally the resulting slaughter of game is to be compared with that of the machine gun during the past war. Large bore guns are prohibited by law, and certainly the use of an agent of destruction such as this should also be prohibited.—S. J. CARPENTER.

TRUE SPORTSMANSHIP.

From time to time a report comes to a deputy of the Fish and Game Commission, during the open season on deer, that a doe or fawn or spike buck has been killed and "let lay" by some unknown hunter.

Unfortunately such unlawful killing has been done accidentally and the hunter has not the nerve to pick up his unlawful game, for fear of law enforcement. The game warden, on hearing such reports, makes a very thorough investigation, and in many cases is unable to apprehend the game violator.

A great deal could be accomplished toward the correction of this harmful practice through the education of the hunters along the lines of true sportsmanship. An appeal should be made to the hunters of our state, that should they accidentally kill a doe, fawn or spike buck while hunting, not to let it lie and rot for fear of being arrested for unlawful pos-

session of game but to be a true sport, bring in the unlawful game, surrender it to the nearest game warden or duly authorized officer of the law and swear to an affidavit as to the true conditions under which this unlawful game was killed. Any judge or jury of men in our state, having the true facts of such an occurrence, would gladly take into consideration such facts and render justice to the law and to the defendant, and the meat of such game would not be wasted but would be donated by the State Fish and Game Commission to some charitable institution.

If such a procedure was followed, it would tend to humiliate the hunter, causing him to be more careful next time. The game would not be wasted. The law would be recognized and enforced. Lastly, it would show a cooperation between the true sportsman and the Fish and Game Commission, the result of which would be to the interest of all concerned.—JOS H. SANDERS.

NEW POLICY ON FISH DISTRIBUTION ANNOUNCED.

One of the serious problems of the Fish and Game Commission is that connected with the enforcement of the law which provides for the screening of irrigation ditches. In many counties the Commission has made persistent efforts to prosecute violators of the law, but with poor success, owing to the attitude of the district attorney. In order to bring about better cooperation in the enforcement of this important law a new policy has been decided upon. Hereafter, the output from the hatcheries will be allotted to those counties which are enforcing the screen law, and those providing suitable protection for the fish planted in the streams. It seems only reasonable that this course be taken to prevent serious loss of the fish which are reared at considerable expense in the state hatcheries.

MAILING LIST FOR "CALIFORNIA FISH AND GAME" REMODELED.

Attention is hereby called to the fact that the entire mailing list of CALIFORNIA FISH AND GAME is being checked over and all those who have not signed cards during the past year will be eliminated from the list.

Although the Commission is anxious that all those really interested receive the magazine, it is imperative that wrong addresses be righted and that those not interested enough to read the quarterly be dropped from the list.

A SUGGESTED SYSTEM FOR CONSERVING YOUNG TROUT.

The time is growing closer to hand when it will be necessary for the Fish and Game Commission to ask for the power, or to have laws passed, whereby every alternate trout stream shall be closed for one year. The year following, this closed trout stream could be opened and the stream that was open the year previous be closed. By such a system small trout of three to six inches, being caught this year, would have a chance to grow for another year. This would afford the fisherman larger fish for his limit and more sport in obtaining his catch. Too often a deputy inspecting shipments of trout to various parts of the state, finds, on opening up the shipment, a limit of twenty-five fish weighing only two or three pounds. The average fish of such a shipment is from three to six inches. If these trout could have protection and be allowed to grow for one year more, what sport would it be to the fisherman to catch such fish!—JOS. H. SANDERS.

DIFFERENT SPECIES OF VIOLATORS.

The field deputies become acquainted with many different kinds of violators of the game laws. Among them is the man who lives twenty miles or more from a butcher shop, has a large family and is hard up. He has some excuse for taking game, but not enough to break the law.

Next comes the city man who never saw a deer, and in open season kills a spike or a doe by mistake. Although he should be punished, he is to be pitied.

Then comes the game hog, who kills bucks and kills more than the limit. It would be a good thing to take his license away from him for a couple of years.

But what may be considered the worst violator—and we have a few in every town—is the fault-finder. He is too lazy to go hunting but he will sit around town and criticise and "knock" the game laws. When the game warden makes an arrest, if this fellow can get to the party arrested, he will do all in his power to get the defendant to stand a jury trial. And when he meets a game warden, he has a big tale of woe and he tells him how the game law is being violated, but never gives a tip, or any facts. He pretends to be a friend, but just as soon as his back is turned, he has his hammer out.

Conservation by education is all right, but a good club would be better for the last named species. He should be classed with the coyote.—J. D. DONDERO.

SAVE THE BABY TROUT.

While out trouting one many times comes across a pool in which are many real small trout. Look! Possibly next week this pool may be cut off from the main stream and these little trout have become land-locked; in a short time they die, due to no feed and fresh water. If you can make a little ditch with your foot or stock of wood, from the pool to the main stream, as the water subsides these little trout will move out to the main stream. This small assistance from every sportsman in California would mean much to good fishing and plenty for next season.—JOS. H. SANDERS.

JUDGE CONVICTS MAN OF OWN PROFESSION.

Judge Jerome Barry of Broderick, Yolo County, believes in enforcing fish and game laws, as evidenced by a recent case in court, the defendant having been found in possession of sturgeon in closed season and offering it for sale. The defendant was a wholesale fish dealer and the justice of the peace, also a commercial fisherman. In fact it was necessary to wait for the justice of the peace to make a drift with his salmon net before he could be induced to try the defendant. The defendant entered a plea of guilty and was fined \$20.00, the minimum fine. The justice of the peace sold his catch of salmon to defendant.—W. J. GREEN.

ALIENS AND HUNTING LICENSES.

The present law which places jack rabbits on the predatory list as not protected, has brought the alien, with his gun, into the field, in the closed season of the game, at the nesting and breeding season. It allows the alien to carry firearms without a permit or license.

A recent case before the police court divulged the fact that an alien took out a \$1.00 hunting license, and when found with a concealed revolver in his possession by the police officer, tried to tell the officer, and later the judge, that he thought the state hunting license entitled him to carry a concealed revolver and parade the streets at night. He was fined \$50.00 after giving battle to the police in the lower end of Sacramento city.

Numerous fines have been obtained by prosecuting aliens who have purchased citizen's hunting licenses in the Sacramento district. Typical of the facts in many of these cases is the following. Recently a Greek, who gave the name of Harry H. Campbell, took out a \$1.00

hunting license and claimed to be a citizen by parentage. On looking this fellow up, his name was found to be Chris Koropulopouski. Registered under the new alien law of the last session of the California legislature, he told the judge the reason he was not drafted in the war was because he had a wife and child. It was found out later on that this Greek registered during the war, in South Dakota, as an alien. He was fined \$50.00 by the judge. A clean-up on such aliens is very much worth while.—W. J. GREEN.

ATTITUDE OF MOUNTAIN PEOPLE ON GAME CONSERVATION.

While performing my work of killing mountain lions, I am brought continually in contact with the mountain people who live in the deer country, and it is a pleasure to note the present attitude of these people in regard to game conservation.

A few years ago, deer of either sex were killed at all times of the year and a game warden was considered an unnecessary meddler. As a result, the deer in many places were almost exterminated. Today, by these same people, the game laws are generally respected and the game warden is a welcome visitor at any time of the year, in most of the mountain homes; usually, too, he has the cooperation of most of the people, who are proud to tell of the many deer that range on and around their ranches.

These people have seen the result of game protection, as many of them have told me that there are twenty deer today where there was one twenty years ago, and now they are very bitter in denunciation of the chronic violator. This changed sentiment is doubtless also the result of the educational work performed by such publications as CALIFORNIA FISH AND GAME, bulletins of the American Game Protective Association, and the sporting magazines and also largely to the personalities and effects of the game wardens and forest rangers.

During the past three years, I have met most of these mountain deputies and forest rangers and have had their cooperation in my work, and I have found them to be, in my opinion, sincere men of good judgment, who use their efforts and influence to prevent violations, whenever possible, by explaining the purpose and benefit of game law enforcement. I believe that to the method and personality of the deputy may be attributed to a large degree, the sentiment of the people in his district.—JAY C. BRUCE.

THE SMALL BOY AND THE ANGLER'S LICENSE.

The instances given in this article of violations of our "trout fishing law" by an element that has no regard for law, and the wiley methods taken to evade the law illustrate some situations which our present law does not cover.

I recall three different instances of recent date, where I have met with young lads fishing for trout before the season was open. One case was in Niles Canyon. A young boy about twelve years of age, was fishing. I watched a grown man approach the boy, bait his hook and retire a short distance away. The boy threw his line. I then walked up to the boy and asked, "What are you doing?" He answered, "Fishing." I told him the season for trout was not open and he must stop. Immediately the man came forward and told me the boy "Too young for license; you no can 'rest him."

Another time, on one of our good trout streams, I saw two men, one much smaller than the other. Gradually I worked my way nearer until I was close enough to see that one was a young boy. The boy had a fishing rod and a bag on the shoulder. The man in this instance, as in the other, baited the hook and removed the fish, walking away each time, then coming back as needed. I watched them for some time, then I approached and asked for his license. The man was immediately "on the job,"—"Leetle boy, he no need license, he just 'leven years old." I asked him for *his* license, telling him I had seen him bait the hook and remove the fish. He replied, "You no can 'rest me, you no see me fish."

One morning, in March last, on Fish Ranch Creek along the Tunnel road, at 6.30 a.m., I found a small boy fishing, using the famous "willow rod and twine string." He had four small trout. I told him to quit fishing and get away before the "rider" found him. Some two hours later, I found the same lad still fishing; this time he had eighteen trout, all sizes up to twelve inches in length. I was somewhat "peevied at him," and took his fish pole. The next day I called upon his parents. His mother said, "I no think eet hurt much for zee small boy to fish—he like fish verry much—one fren' tell heem no can 'rest heem."

I think if parents encourage the boys to fish, and enjoy the fish that the small boy catches, that it is only right that they be held responsible for their son's violation of the law.

The small boy catches as many fish as the sportsman, so why not a license for the small boy who fishes as well as for the small boy who hunts?—J. L. BUNDOCK.

LARGE PROPORTION OF VOTING POPULATION SECURE LICENSE.

Many guesses are made as to the proportionate number of persons sufficiently interested in fishing or hunting to take out licenses. Here are figures from Plumas County for 1921, which show what a large proportion of the population of this county are interested in fish and game. Hunting licenses sold in Plumas county, 1921, 829; fishing licenses sold in 1921, 889; total, 1718. The voting population of Plumas County as taken from register is 2284.

ANTELOPE HERD CAREFULLY PROTECTED.

The California Fish and Game Commission is taking an active interest in the herd of antelope still existing in Modoc County. This herd is really the only sizeable remnant of the former herds which ranged the plains of the state. In past years poaching by Oregon hunters has endangered the herd, as has also reduced food supply during severe winters. Four deputies of the Fish and Game Commission are now stationed within a radius of sixty miles and one man devotes most of his time in protecting the animals. During the past winter a considerable amount was spent in feeding the herd.

TROUT MUST HAVE CHANCE TO MATURE.

Continual complaint comes, especially from coastal streams, that fry planted the year before are continually caught by fishermen the following spring. The conservation of a supply of trout is dependent upon some of the fishes reaching maturity, plus the planting of fish from state hatcheries. Some means must be found for preventing the capture of small fish. The size limit law of several years ago has been discarded and now but two alternatives present themselves. Either by education anglers must be taught to leave the small fish in the stream or every stream stocked must be closed for a year or two to give the fish a chance to mature.

WESTERN ASSOCIATION OF GAME COMMISSIONERS WILL MEET IN SACRAMENTO.

The Western Association of State Game Commissioners has accepted the invitation of the California Fish and Game Commission to meet in Sacramento for a

two-day session on December 4 and 5, 1922.

David H. Madsen, president of the organization, states that representatives from nine different states will be in attendance and that many matters of importance will be discussed. As in the meeting last year at Salt Lake City, round table discussion will be emphasized and the special problems of the western states will be considered. It is the intention of this association to make the needs of the western states felt in game conservation.

PUBLIC SHOOTING GROUND-GAME REFUGE BILL.

All sportsmen are watching with interest the progress of the Public Shooting Ground-Game Refuge Bill, (H. R. 5823), which is still before Congress. Late last spring, the House Committee on Agriculture amended the bill in such a way that all moneys collected would go into the general treasury, from which appropriations would be made to carry out the purposes of the bill. This did not meet with the approval of sportsmen, even though many assurances have been given that more money would thus be received by appropriation than was produced by the bill. The intention now is to demand the original provisions of the bill and to add amendments which will do away with the opposition from western states as to the provision which would endanger local control of fish and game.

LAW ENFORCEMENT.

The results of the clean-up of violators of the fish and game laws in the Sacramento Valley show a contrast to attempted prosecutions of, say, ten years ago. The cooperation of the judges at the present time plays an important part in the success of the Fish and Game Commission in making the fish and game laws respected. At one time last winter four violators could have been found in one county jail at one time. One of these men was given a sixty-day sentence and another one a one hundred-day sentence. A violator soon forgets about a small fine but he does not soon forget days spent in jail.

ELK MOVED.

Last spring about twenty elk, which were placed near Pacific Grove by the California Academy of Sciences several years ago, and which have been causing damage in dahlia gardens at this place were captured and moved by the Commission to the Hutchinson Ranch west of

Williams, Colusa county. Hunters have been kept out and the animals seem to be doing well. Four calves have been noted this summer.

One large bull elk apparently wandered away from the herd and took up its home on a ranch in Sonoma County, near Santa Rosa, where it was carefully watched by the owner. When the animal suddenly disappeared, an investigation was made and the animal was found shot through the head by some careless hunter. A reward has been offered by the owner of the ranch for the apprehension of the person killing this elk.

CAMPERS, A PROBLEM IN CALIFORNIA.

Game law enforcement in eastern states is a much easier matter than it is in California. It is seldom that campers are to be seen in the open, even during the summer. Most hunters and fishermen stay at some well known resort and consequently are more easily watched by the game wardens. In California, the number of campers in the mountain districts must nearly reach the million mark. They are scattered in every out-of-the-way district where a passable road is available. As our game wardens can not be everywhere at the same time, it is practically impossible to watch all these recreationists. From this standpoint alone, it is obvious that California should have a much larger proportion of game wardens than eastern states and yet this is not true. States with a much less area and with a smaller problem have twice as many deputies as the state of California.

FRY OUTPUT WILL BE LARGE.

Although conditions earlier in the season make the outlook for a successful output of trout fry from the state hatcheries look very dubious, the final outcome has exceeded expectations. Handicapped by heavy snows and freshets, the spawn-takers at first secured few eggs, but later a splendid take was obtained. It is expected that when the last trout leave the hatcheries for new homes in the streams the total for the season will be close to twenty-six million, the largest output of trout in many years.

Of special interest was the hatch of cutthroat trout, secured from eggs furnished by the United States Bureau of Fisheries. These cutthroat trout were secured especially for Humboldt County, where conditions favor the planting of this Rocky Mountain species.

STATE FAIR EXHIBIT.

As in past years, one of the distinct attractions at the State Fair at Sacramento in September was the exhibit made by the California Fish and Game Commission. On those days when the attendance was the greatest a count showed 1500 persons, per hour, viewing the exhibit. The panorama of the Sierras was remodeled this year in order to depict a spring scene. Beautiful green meadows and a meandering river, with snow-capped mountains in the distance replaced the old scene. The usual lighting effects, with the addition of a thunder storm, were utilized.

Aquaria contained the different species of trout and all fresh water fishes found in the Sacramento region. Golden trout from mountain lakes at an elevation of 10,000 feet, after a journey of nearly a thousand miles by pack train, truck and railroad, were on display. Baby trout just hatched from the eggs and baby salmon were to be seen in the small model hatchery. The department of education and publicity featured a baby mountain lion which had been caught by the state lion hunter, and some baby flying squirrels. A display of skins of fur bearing animals, display of the publications of the Commission, charts showing the food habits of birds, and framed pictures completed this part of the display.

Those who visit the State Fair can not help but be convinced of the extensive work being carried on by the Commission in caring for and conserving the fish and game resources of the state.

PREDATORY ANIMAL CONTROL ON SPRING VALLEY WATER COMPANY PROPERTY.

Predatory animal control by means of systematic trapping and a strict rule that prohibits hunting have made of the extensive watershed properties of the Spring Valley Water Company in San Mateo County a great game refuge.

The particular area in which trapping operations have been carried on, is the watershed of upper San Mateo Creek and Pilarcitos, lying to the west of Billbrae and Burlingame. It consists of open and wooded country, the latter clothed with firs, oaks, grease-woods and lilacs. Wild oats, hill and valley grasses grow in profusion. There is also alfilerilla and clover.

For years no hunting has been allowed in this, nor in the rest of the San Mateo watershed area, and deer have greatly increased in consequence. Quail, however, appear to have decreased to a very

marked extent, and it was to give additional protection to these and other ground-nesting birds that predatory animal control was instituted. The campaign has been carried on vigorously by the Water Company since 1912.

Trapping, some seasons, has extended over an area of $14\frac{1}{2}$ square miles. Last season it covered an area of $10\frac{1}{2}$ square miles. Trapping was done by employees of the company.

The accompanying photograph shows 68 of the 84 animals trapped during the

to continue the cooperation, not only along the lines already followed, but also in the solution of this puzzling problem as to why predatory animal control alone is not sufficient to cause an increase in quail.—W. B. LAWRENCE, Millbrae, Cal.

FINED FOR POSSESSION OF UNDERSIZED ABALONES.

On the 26th of January, 1922, Tony Ambra, an Italian of San Francisco, was arrested by Deputy John Burke near

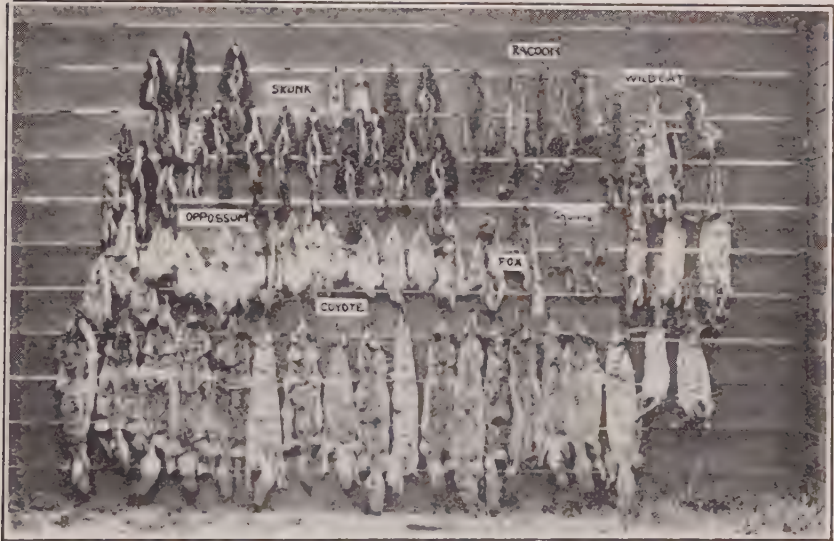


FIG. 88. Sixty-eight of the 84 animals trapped during season of 1921-22 on an area of about $10\frac{1}{2}$ square miles, on the San Francisco peninsula. Photograph by W. B. Lawrence.

season of 1921-22. Among the animals trapped were a number of feral domestic cats, a large number of opossums, also coyotes, coons, foxes, skunks, weasels, badgers and civet cats. The opossum has spread rapidly, and a total of 39 has been taken since its first appearance in 1918.

The systematic trapping thus carried on constitutes an interesting experiment as to whether predatory animal control leads to a notable increase in game species.

Quail have decreased in number, so doubtless predatory animal control is but one factor in the problem, and there are doubtless others of importance that would be revealed by a more intensive study.

Spring Valley Water Company has always cooperated heartily with the Fish and Game Commission, and will be glad

Point Pedro in San Mateo County, for having in his possession undersized abalones in violation of section 628f of the Penal Code. He was caught as he attempted to hide his illegal catch in his automobile. By actual measurement many of the abalones measured from two to three inches, whereas the minimum size limit is seven inches. The offender was taken before Judge Ray Griffin of Redwood City, who imposed a fine of \$100.

DOVES ARE MIGRATORY BIRDS BY LAW.

Whether doves are protected by the federal law was tested during the year in the case of the *United States vs. Lumpkin* (276 Fed. 580) in the federal court for the Northern District of Georgia. The defendant, charged with

killing mourning doves during the federal closed season, contended that the doves killed by him were not migratory but had remained throughout the year in the state. The court held that the treaty between the United States and Great Britain for the protection of migratory birds declares that mourning doves are migratory, and the fact that an individual bird hunted or killed had remained the entire year within the state is no defense in a prosecution for a violation of the act of Congress to give effect to the treaty. The defendant was convicted and fined.

GAME AN IMPORTANT PART OF MENU ONLY FIFTEEN YEARS AGO.

Alaska and the Canadian Northwest has long been the mecca for big game hunters. Reports of the disappearance of game in these sections now come with alarming frequency. "The good old days" are fairly well described by the following menu which recently came to the hand of the editor:

FRIDAY APRIL 10, 1908

THE KING EDWARD CAFE
Dawson, Y. T., Canada

Short Orders at All Hours a Specialty

<i>Soup</i>	Clam chowder	Bouillon	
<i>Fish</i>	Boiled white fish, egg sauce	-----	\$0.75
	Fresh Yukon greyling to order	-----	1.00
<i>Boiled</i>	Brisket of veal with oysters	-----	.75
<i>Entrees</i>	Calf moose cutlets with bacon	-----	.75
	Roast beef hash, poached egg	-----	.75
	Stewed beef and vegetables	-----	.75
	Fried eastern oysters on toast	-----	1.00
<i>Roasts</i>	Prime rib beef au jus	-----	1.00
	Loin of pork, apple sauce	-----	.75
	Leg of caribou and jelly	-----	.75
	Fried eastern oysters on toast	-----	1.00
<i>Cold</i>	Chicken, \$1; Beef, \$1; Ham	-----	.75
<i>Extras</i>	Whole ptarmigan on toast	-----	1.25
	Calf brains to order	-----	1.00
	Mountain sheep cutlets to order	-----	1.00
	Arctic trout to order	-----	1.00
	Bear steak to order	-----	1.00
	Fresh greens, per order	-----	.75
	Fresh ranch eggs, each	-----	.50
<i>Dessert</i>	Pudding		
	Assorted pies or cakes	-----	.25
	Tea	Cows milk, 25c	Coffee

HOW FAR DO BIRDS GO WHEN THEY FLY SOUTH?

The marking of migratory water-fowl, as practiced by the collaborators of the Biological Survey, United States Department of Agriculture, has given evidence

that it will be a most interesting and important investigation. Although the work has been in progress for only two years, notable results have already been secured.

The ducks and other birds, whose movements are being studied by this method, are caught, mainly by the use of special traps, light aluminum bands placed on one leg and then released. Every band bears a serial number and the legend "Biol. Surv., Wash., D. C." In the Washington office of the Biological Survey, these banded birds are card indexed so that when a hunter secures a duck bearing one of these bands and reports the data connected with its capture, by referring to the card file, the route covered by the bird in question can be easily ascertained. When such records are received, the hunter is advised where the bird was banded, while the person who attached the band is informed where it was secured.

During the fall shooting seasons for the last few years, a large number of mallards and black ducks, with a few blue-winged teal and other species, have been banded at a small lake about twenty miles north of Toronto, Ontario, and many interesting returns have been received.

Long Range Record.

The best 'long range' record for these Canadian ducks is that of a blue-winged teal, banded September 24, 1920, and killed two months and seven days later, in the Caroni Swamp, near Port of Spain, on the Island of Trinidad, just off the coast of Venezuela. The shortest flight that this bird could have made would be over 3,000 miles. It is a well-known fact that blue-winged teals and certain other ducks that breed in North America spend the winter season in South America, but it was rather a surprise to learn that those individuals that had bred in Canada would make the long flight to South America, because the species also winters in small numbers in the Gulf region and it is to that area that the more northern birds might be expected to go.

The return records of ducks of other species, banded near Toronto, have afforded valuable data relative to their migration. The lake where the banding was done, Lake Scugog, is surrounded by marshes and thus offers excellent opportunities for the ducks to feed and rest before starting the long flight to the south. The trapping and banding was carried on continuously through the autumn, so that by the time the big southward movement began several hundred birds had been marked. At this time the season was open from the Great Lakes to the Gulf of

Mexico and the migrating birds had to run a veritable gauntlet of sportsmen. A large number of 'return records' were therefore received.

Mallards and Black Ducks.

In tracing the route of these birds it seemed apparent that the mallards and black ducks traveled together and their course from Lake Scugog was southward along the shores of Lake Erie by way of the St. Clair flats. Here the route divided, the majority continuing toward the southwest, crosscountry to the Ohio River, hence to the Mississippi Valley where many of them spent the winter. The second group, that parted from their fellows in the vicinity of Lake Erie, took a southeasterly route, crossing the Alleghenies and reaching the Atlantic coast by way of Chesapeake and Delaware bays. It is interesting to note that although both of these ducks are present and the black duck is plentiful along the coast of New England, none of the birds marked at Lake Scugog were taken in that region. The question that naturally arises is: Where do those ducks come from? So far we only know that some breed in that area, but we do not know just where the migrating birds come from that use that route. Bird banding will probably supply the answer when it has been applied more intensively at a larger number of stations.

SHELL FISH RESOURCES OF THE NORTHWEST.

Those who have been interested in the recent fish bulletin number 4, on "The Edible Clams, Mussels and Scallops of California" will find additional material along the same line in a recent publication of the Bureau of Fisheries (Document No. 920). The Bulletin is entitled "The Shellfish Resources of the Northwest Coast of the United States," by Charles H. Edmondson.

This bulletin is based on observations made by Mr. Edmondson in 1917-1919, in a survey by the United States Bureau of Fisheries, of the shellfish resources of the northwest coast of the United States including the shore line, bays, and rivers of the State of Oregon and the southern portion of Washington. First the more important shell fish centers, each with its own peculiar characteristics, is discussed, and following these, consideration is given to the less important centers. The species of shellfish found in each region and their distribution, relative abundance,

and importance are indicated. The report is splendidly illustrated with twenty-five plates showing photographs of some of the regions discussed and of the typical shellfish of the Northwest.

SUMMARY OF 1922 LAWS RELATING TO FUR ANIMALS READY.

The legislatures which met in eleven states during the year made but few and unimportant changes in the laws relating to fur animals, according to the annual summary just issued by the United States Department of Agriculture, which, through its Bureau of Biological Survey, is charged with the administration of federal laws relating to the fur industry. Copies of the publication, entitled "Laws Relating to Fur Animals, 1922," by George A. Lawyer, chief United States game warden, and Frank L. Earnshaw, assistant, may be had by writing to the department at Washington, D. C.

In Alaska shooting of fur animals is now permitted, but beaver houses or runways may not be destroyed. Foxes certified as disease-free by an official veterinarian of another country may be imported without quarantine. In Montana a person suffering damage from beavers may get a permit to take these animals on his own premises, but skins so taken must be cared for, properly cured, and sent to the state game warden for tagging. A special permit must be secured in order to ship the skin out of the state.

Evidence of illegal shipments of fur has been uncovered in the course of checking up shipments and receipts of furs by the principal fur houses of the country. These cases have been prosecuted and fines and penalties totalling several thousands of dollars imposed.

Not all states offer bounties for undesirable animals, although in most states where predatory creatures give trouble there is a price on the heads of wolves, mountain lions, bobcats, coyotes and similar destructive animals. Sometimes the county or township pays the bounty. In Wisconsin the state treasurer duplicates all county awards. Seals are considered a pest in Massachusetts, as well as in the State of Washington. Anyone who can catch a panther in New York or California is entitled to \$20 bounty. Bears in Pennsylvania have an open and closed season, although they may be killed at any time in defense of person or property. American trappers receive yearly many millions of dollars for their fur harvest.

ELK HERDS NEED PROTECTION AND FORAGE DURING WINTER.

The estimated number of elk remaining in two large groups in the United States at the present time is only about 52,000, according to the Biological Survey of the United States Department of Agriculture. To insure the permanence of these splendid game animals, which are among the largest and finest of all deer, the cooperation and coordination of federal, state, and all other interested agencies is needed.

The elk of the Yellowstone Park region constitute the only really large herds of big game remaining in the United States, and although these number about 25,000, they are a mere remnant of the great herds which formerly ranged from Maine to California. The northern group, which ranges within the Yellowstone National Park in summer and migrates northward, suffered greatly from the adverse conditions of the winter of 1919-20.

The elk in the southern group are scattered in summer at high elevations in the southern part of Yellowstone Park, and in the mountains of the Teton, Bridger, Wyoming, and Washakie, National Forests. With the first heavy snowfall they descended to lower levels, where their winter range has become more and more restricted by the coming of settlers. Thousands of elk congregate in the path of their former migration in the vicinity of the winter refuge maintained by the Biological Survey at Jackson, Wyo. A winter feeding ground at this point attracts many elk, and it has been found necessary to furnish a supply of hay for them. Feeding is not recommended, however, where natural winter forage in sufficient quantity is available.

The other principal herds remaining on

their native ranges are the Roosevelt elk, confined to the Olympic mountains in northwest Washington, and smaller isolated groups, mainly near the Pacific coast, which include the valley elk in a small area at the lower end of the San Joaquin Valley, California. If an elk is estimated to be worth \$75, the value of the present herds in the United States would be approximately \$4,000,000, which is a substantial national asset.

Within the past 10 years several thousand head of elk have been transferred from the Yellowstone Park region to localities in many states for restocking purposes. In Arizona, where conditions are suitable, these transplanted herds are thriving. In other districts it has been demonstrated that it is unwise to introduce elk on restricted areas near farming communities as more or less injury to crops occurs and claims for damages are to be expected.

The high mortality among elk in recent years has been due partly to weather conditions, such as periodical summer droughts followed by unusually severe winters, and partly to the encroachment of settlers, through whom much suitable winter range is eliminated. Hunters kill elk as game and many of the finest animals become victims of tooth-hunters operating illegally. Mountain lions, lynxes, wolves, and coyotes also kill many.

Adequate winter range, affording sufficient forage, and adequate winter protection must be provided if elk are to be maintained even in moderate numbers. In the opinion of the United States Department of Agriculture, limited areas of hay land urgently needed to supply forage for winter use should be purchased.

FACTS OF CURRENT INTEREST.

The 1922 output of trout from the state hatcheries will be near the twenty-six million mark.



The dove season just past has furnished plenty of sport to those interested in this bird; limit bags have been the rule.



Growing interest in conservation is resulting in the formation of many fish and game protective associations. More than a dozen active organizations of this kind are now to be found in the state.



Motion pictures of the spawning of salmon on the Klamath River will be taken this fall to be used in the educational work of the Commission.



The overflowing of several sections of grain land in the bed of Tulare Lake the past summer, and the subsequent pumping out of the water, has furnished splendid feeding ground for ducks and these birds have appeared in large numbers. Fortunately there has been no recurrence of the duck disease which decimated the ducks of this region in 1908-1913.



A reading of this magazine will show that still another non-native species has become acclimated in California. This time it is not a game mammal nor a game bird, but a game amphibian—the bullfrog. The bullfrog is actually hunted for food and for sport and so may properly be termed game.



The biennial report of the Fish and Game Commission now in preparation, will detail the accomplishments of the past two years. In law enforcement, hatchery output, educational activities, and in fact in all lines of endeavor, they have been banner years.



Fish are to be furnished hereafter to those counties which will properly care for them. Has your county proper fishways and proper screens at the intake of irrigation ditches? These are necessary precautions in the protection of trout fry.

COMMERCIAL FISHERY NOTES.

N. B. SCOFIELD, Editor.

SALMON INVESTIGATION.

The salmon investigation which started four years ago with the marking of young salmon at the Mount Shasta Hatchery, is now showing developments of great interest. Dr. J. O. Snyder of Stanford University, in charge of the investigation, has spent the past three months in the field, aided by three assistants. Particular attention has been given to a search for returned marked salmon at the principal trolling districts, Monterey, Point Reyes, Fort Bragg and Eureka. A disappointing number of returns have been secured, but those taken have added interesting information as to the life history and distribution of the salmon. Last year twenty-three were secured; this year two were taken in Monterey Bay, two at Point Reyes, one at Fort Bragg, five at Eureka and only one at the place where the greater number were expected—on the lower Klamath. The results again indicate a wide distribution of the Klamath river salmon during its life in the ocean. It will be remembered that Sacramento salmon marked several years ago, were taken at Monterey, Pittsburg, and Shelter Cove, Mendocino County.

Results this year point to the possibility that the additional marked salmon to be secured this year, when the spawning season begins at the Fall Creek Hatchery on the Klamath, will be males, and that most of the marked females will return next year, five years after their liberation in the Klamath river. It seems reasonable to believe that holding the young salmon in ponds at Mount Shasta Hatchery might make them mature a year later than those reared naturally in the stream.

In recovering marked salmon, light is thrown on the movements of this valuable food fish in the sea, about which little has been known heretofore. From the practical side of fishery conservation, it will furnish evidence as to what streams are being drawn upon in the different trolling districts.

Extensive marking experiments will be carried on this fall on both the Sacramento and Klamath rivers, in order that still further facts in the life history of this species may be found and utilized in protective legislation.

MEXICO ATTEMPTS FISHERY CONSERVATION.

Professor Carlos Cuesta Terron has been placed in charge of the west coast fisheries by the Mexican government. With headquarters at San Diego, California, he will have a chance to study and plan proper protective legislation for the vast fisheries of the Lower California coast, and at the same time will have a chance to study American methods.

Professor Terron promises cooperation with the California Fish and Game Commission in its fishery conservation work and proposes uniform laws on fisheries in the two countries.

CANNERS WILL BE FORCED TO SECURE ACCURATE WEIGHT.

Because of the need for accurate weighing of fish received at the canneries so that the fishery statistics gathered may be correct and also in order that a careful check may be obtained of the amount of food fish sent to reduction plants the Department of Commercial Fisheries is planning supervision by the state sealer of weights and measurer. A meeting of canners looking toward the consummation of this plan was held at Monterey on September 21.

COMMERCIAL FISHING LAWS ENFORCED.

Fish and game deputies working in the San Pedro and San Diego districts under the department of Commercial Fisheries made 131 arrests between January 1, 1921, and July 1, 1922, for violations of the fish and game laws. Thirteen arrests were made for violations of the laws relating to spiny lobsters. Of these two were acquitted, two received suspended sentences, while the remaining nine paid fines totalling \$300. Twenty-five arrests were made for violations of Sec. 628e of the Penal Code relating to surf fish, croakers, undersized halibut and barracuda. Convictions were obtained in each case and the fines totaled \$1,685. Six arrests were made and convictions obtained under Sec. 628f of the Penal Code relating to abalones and clams. The fines amounted to \$225. Eighteen arrests were made for violations of Sec. 636 of the Penal Code relating to net fishing. One of the eighteen was acquitted while nine received suspended sentences. The remaining eight paid fines totalling \$1,100.

Three arrests were made and convictions obtained under Sec. 636½, a special section relating to paranzella and drag nets. Fines were collected amounting to \$300. Four arrests were made for using nets within 750 feet of a pleasure pier. Of these two were dismissed and the other two paid fines to the amount of \$100.

Sixty-two arrests were made for fishing without commercial fishing licenses and paid fines amounting to \$660.

In addition to the fines aggregating \$4,370, fourteen nets were seized and confiscated. The deputies also seized and distributed to state and charitable institutions, 271 pounds of abalone, 40,510 pounds of barracuda, 3500 pounds of croaker, 8559 pounds of halibut and 972 pounds of lobsters.

SALMON FISHERY IN DANGER.

The salmon catch in California this year has been so poor that most salmon fishermen and fish dealers are now convinced that the salmon have been overfished and that radical fishing restrictions must be adopted if we are to save the remnant of the run of this valuable fish. The efforts of the Fish and Game Commission during the past several years to restrict the catch have been opposed by both river and ocean fishermen as well as by some of the fish dealers. This opposition, aided by lobbyists at Sacramento, has so far prevented proper legislation. If radical measures are not taken at the next meeting of the state legislature to further protect the salmon we are sure to see the same old story enacted again—of action being taken only after the species has become commercially extinct.

FEDERAL POWER COMMISSION DENIES PERMIT FOR KLAMATH DAM.

The Fish and Game Commission's fight to prevent the destruction of the Klamath river salmon run by the erection of impassable dams for the development of hydro-electric power has resulted in the Federal Power Commission denying the application of the Electro-Metals Company to build high dams on the lower Klamath river within the Klamath National Forest. The Electro-Metals Company proposed to develop electric power and transmit it to Trinidad on the Humboldt County coast and there use the power to smelt bauxite ore which they said they would bring from British Guiana.

The Fish and Game Commission protested against the granting of this permit contending that if dams of the height proposed are built on the lower Klamath

river the salmon run on the river would be destroyed. It contended also that enough electric power can be generated from the water in the upper tributaries of the streams so that it is not necessary to destroy the salmon by putting insurmountable barriers where the salmon will be prevented from reaching their spawning grounds. It contended that the fish which enter the stream belong to the people of the state and that the people's proprietary right to the fish can not legally be taken from them. The comparative money value of the fish as compared with the power that would be developed should not enter into the discussion although it does constitute a large part of the arguments of power promoters and electrical engineers.

FUNDS INSUFFICIENT FOR SALMON CONSERVATION WORK.

With the growing scarcity of salmon the Fish and Game Commission's salmon conservation work has had to be increased. This has necessarily been accompanied by an increased expenditure of money along this line. There is a necessity for increasing the salmon hatchery work as well as a necessity for increasing the salmon investigation and patrol work. The state spends annually more than \$25,000 in hatching salmon and the United States is spending a like amount in this state for the same purpose. The commission desires to increase this work. Added to the hatchery work there is the expense of the salmon patrol and investigation work which amounts to more than \$20,000 each year. The Fish and Game Commission receives no appropriation for this work but must finance it out of the revenue from commercial fishing licenses and the very small amount received from the tax on salmon which are canned or salted. The entire amount received from all commercial licenses sold in northern California, together with the tax on salmon for canning and salting is not nearly sufficient to pay even the state's portion of the expense of salmon hatching to say nothing of the patrol and investigation work which are equally necessary. The bulk of the salmon which are caught are used in the fresh markets and the fish which are used in the fresh markets pay no tax for conservation work. It will be necessary in the fight to save the salmon to increase the revenue for conservation work in the districts where the salmon work is being done. Fish used in the fresh markets should be taxed to furnish a revenue sufficient to carry on this very necessary work.

STRIPED BASS DECREASING.

The annual commercial catch of striped bass in California shows a decrease of about 50 per cent since 1915, and along with this decrease in the commercial catch is a decided scarcity of bass in many of the haunts where both anglers and commercial fishermen formerly found them abundant. The present scarcity is most noticeable in most parts of San Pablo Bay and in the mouths of sloughs tributary to it. On the other hand striped bass are apparently more plentiful in some other places and good angling has been enjoyed in places where they had been caught only in very limited numbers before. There are some ardent striped bass anglers who believe that these fish are just as plentiful as they ever were. They believe that some of the sloughs have been fished out by anglers but that in most cases the bass have moved from their old haunts and have to be sought in other places. Commercial fishermen say that the bass are about as numerous as ever but that they have moved and that the best net fishing is to be found in places where the bass were formerly not so abundant.

Most bass anglers, however, are firmly of the opinion that the bass are not only less plentiful but that they are on the road to extermination. It is our belief after reviewing all the evidence that striped bass are not so plentiful and that they are being over fished at the present time. It should not be argued that the falling off of the commercial catch shows that the bass are being fished out by the nets and that there are less than half as many bass as in 1915. It is very much more likely that the 50 per cent decrease in the commercial catch is almost entirely due to the very good restrictive legislation which has been obtained through the efforts of the Fish and Game Commission and the commission's efficient enforcement of the protective laws.

The usual method of protecting fish against overfishing is to restrict the catch and when efficient protective measures are adopted and enforced the resulting decrease in the catch should not be used as evidence that the fish are being exterminated. The scarcity of bass in some of their old haunts about San Pablo Bay we believe is largely due to the bass moving to other regions. This movement is largely due to the pollution of San Pablo Bay waters by the Government's dredging operations about Mare Island and in deepening the channel from Mare Island to Pinole Point. Much dredging has also been done about the mouths of the more important sloughs. The continued stir-

ring of the mud by dredging operations has caused the tides to carry great quantities of silt over the bay and into the mouths of the sloughs where it has settled to the bottom like a blanket and has pretty effectually killed the diatoms and other plant life which form the basis of the food supply of fishes. This condition was called to our attention by Dr. Albert Mann of the Carnegie Institution after he had made a diatom survey of San Francisco and San Pablo Bay waters. Dr. Mann was alarmed by the conditions he found in San Pablo Bay and stated that if we are to preserve our fisheries we will have to guard against the blotting out of diatom life by silt from dredging operations such as taking place in our bays and rivers. There can be no doubt that the pollution of the waters by sediment from the dredgers has caused the bass to largely abandon their old haunts about San Pablo Bay. Oil pollution may also be a contributing factor. The best evidence that striped bass are being depleted by fishing operations is the growing scarcity of large individuals. This is one of the surest signs of depletion and very nearly every one agrees that there are fewer large bass. Striped bass need more protection but protection is more urgently needed in the case of the salmon. As these two fish in the San Francisco Bay region are caught by the same fishing methods and are to a large extent caught at the same time in the nets it is necessary to protect both if we are to protect either, so striped bass and salmon protectionists are proposing to get together and aid the Fish and Game Commission in the better protection of the two fish.

BAIRD HATCHERY AGAIN OPEN.

For the first time in three years salmon eggs are being secured at the Baird Hatchery on the McCloud river, by the United States Bureau of Fisheries. By the middle of September 800,000 eggs had been secured and many ripe fish were being held for spawning. It will be remembered that salmon have failed to reach this station on the McCloud river during the past three years, owing to the Anderson-Cottonwood irrigation district's dam across the Sacramento River at Redding, over which there was no suitable fishladder. Injunction proceedings by the Fish and Game Commission last spring resulted in the remodeling of the dam to allow progress of the fish up the river. The high water in the stream has perhaps been most instrumental in the conditions existing this year, for additional work will probably be necessary to satisfactorily care for the migrating salmon at the dam.

CONSERVATION IN OTHER STATES.

NEW YORK PASSES ALIEN GUN LAW.

New York at its last legislature passed an alien gun law which lines this state up with Pennsylvania, long famous for its alien law. The provisions of the law require every man purchasing a hunting license to state where he was born, or, if foreign born, to produce his naturalization papers before a license can be issued to him. The bill provides further that it shall be unlawful for any unnaturalized foreign-born person resident in the United States, to hunt any wild bird or animal except under the special license issued directly by the Conservation Commission, and to that end it is made unlawful for any such person to own or possess a shot gun or rifle. The special license makes it possible to grant special permission to responsible persons. Provision is also made for the forfeiture of any gun held by an alien without a special license.

Such a law is helpful in many ways. It controls the hunter from the south of Europe, who is ready to shoot everything from a song bird to a deer out of season, and thus facilitates the warden's work, and it will doubtless reduce the number of murders, as it was shown to do in the state of Pennsylvania, by taking away weapons from dangerous characters. Furthermore, it will be an incentive for the alien to become a citizen, for sentiment is growing everywhere in favor of issuing licenses only to those sufficiently interested in this country to become citizens.

UNIQUE HUNTING LICENSE IN MAINE.

One of the most unique hunting license systems in the United States is to be found in the State of Maine, where it costs a resident but 25 cents for a hunting license which is good for life. The state collects but 10 cents out of the 25 cent license, the rest going to the seller of the license. The main income for fish and game administration comes from appropriations and from non-resident license fees.

LOWER CALIFORNIA HAS NEW GAME REGULATIONS.

In the northern district of Lower California new regulations adopted by the present governor fix the period September 1 to February 28 as the open season

for hunting game and require separate licenses (fees \$10 each) for large and small game; the females and young of deer, antelope, and mountain sheep are protected at all times; the daily limits on deer are 4; antelope, 2; sheep, 2; ducks, 40, and quail, 50.

ALBERTA REDUCES LIMIT ON SHEEP AND GOATS.

Alberta has reduced the limit on mountain sheep and on goats from 2 to 1 each a season, and has provided that the holder of a general license, upon obtaining a special license (fees, nonresident, \$25; resident, \$2.50), may hunt deer, moose, and caribou in the Rocky Mountain forest reserves of the Province during September and October.

MARYLAND CLOSES SEASON ON DEER.

The close season for deer has been continued in Maryland until 1926, after which the open season will be from November 10 to November 20, and the limit one buck with horns not less than 4 inches long. A fixed penalty of \$300 or 90 days in jail, or both, is prescribed for the illegal killing of deer in the state.

MISSISSIPPI'S NEW GAME LAW.

The provisions of the new game law of Mississippi relating to migratory birds practically conform to the federal law and regulations but no provision becomes effective in any county until adopted by its board of supervisors.

INVESTIGATION OF ALASKA PENINSULA FISHERIES RESERVATION.

Dr. Charles H. Gilbert, of Stanford University accompanied by Willis H. Rich and W. P. Studdert, this past summer made a thorough investigation of the Alaska Peninsula Fisheries Reservation to determine whether the present regulations are adequate to keep the fisheries of that district in perpetuity. They investigated the spawning beds, marked many fish with metal tags to determine whether the fish are local in their origin or are merely a body of fish moving through that district to other sections. Upon these investigations will be determined the character of future regulations for the reservation.

FOOD OF PELICAN TO BE INVESTIGATED.

Dr. Henry B. Ward, of the University of Illinois, Urbana, Ill., has been employed to conduct investigations of the pelican in relation to the fishes of Yellowstone National Park, with the view of ascertaining to what extent these birds prey upon the fish and whether or not they serve as hosts for the parasite which infests many of the trout of the park waters.

CARP PROPAGATION IN OHIO.

At the earnest solicitation of the commercial fishermen, the United States Bureau of Fisheries again undertook carp propagation last spring for the third

consecutive year at points on the Portage river, near Port Clinton, Ohio. The efforts to obtain ripe eggs met with unusual success, upwards of 92,000,000 being secured for artificial incubation between May 24 and June 24. The fry resulting from these eggs will be liberated on the local spawning areas.

GAME REFUGES TO BE ESTABLISHED IN NEW YORK.

The Conservation Commission of New York is authorized to set aside 100,000 acres of state-owned lands in the Adirondack Park as game refuges, but no area can be so set aside without the approval of the board of supervisors of the county in which it is located.

LIFE HISTORY NOTES.

OPOSSUMS INCREASE IN TULARE COUNTY.

There have been two or three opossums (*Didelphis virginiana*) caught in the Tule river country, east of Porterville, and one was recently caught further south in the Kern river country. A number of years ago Dr. Hardenman of Porterville secured several opossums and turned them loose in the South Tule region. No doubt these are the offspring of the ones turned loose. One was on display in the windows of the Porterville Chamber of Commerce last winter and is now in captivity in the city park.—FRANK P. CUNNINGHAM, Porterville, California.

TROUT GROW LARGE IN LAKE TAHOE.

Lake Tahoe has long been famous for its splendid lake fish. The trout most commonly caught is a variety of cut throat known as the black spotted or Tahoe trout. Large ones, like the one in the accompanying photograph, are sometimes taken. The picture shows Mr. Lorentz holding a fourteen and a half pound black-spotted trout (*Salmo henshawi*), caught near McKinney's during June, 1922.—JOS SAUNDERS, Truckee, California.

FOUR-POINT BUCKS NUMEROUS IN TRINITY COUNTY.

It is becoming more and more important to keep accurate statistics regarding the deer killed in order that scientific

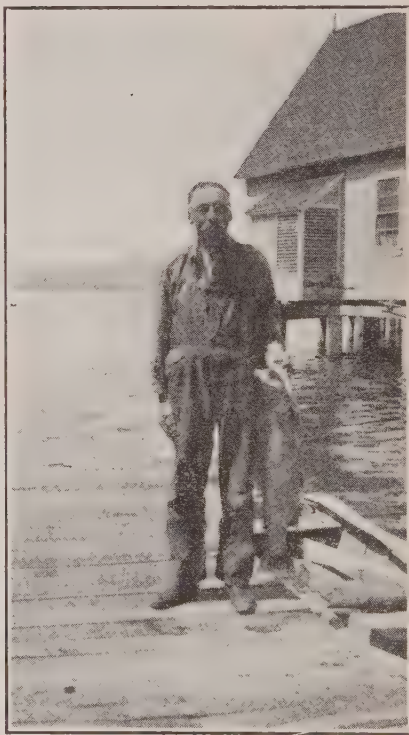


FIG. 89. A sizable black-spotted trout in Lake Tahoe near McKinney's; weight 14½ pounds. Photograph by Jos. Saunders.

data may be available to demonstrate exactly the number of deer that may safely be taken each year without impairing the breeding stock. A careful check of the black-tailed deer killed in my part of Trinity County during 1921, segregated according to the size of the buck, should prove of value in this connection.

Number of five-point bucks	5
Number of four-point bucks.....	24
Number of three-point bucks.....	18
Number of forked horn bucks.....	12
Number of bucks unspecified.....	60
Number of deer found dead.....	34

Total 153

There were four horses and sixteen head of cattle shot for deer in Trinity County during the hunting season, and two fatal hunting accidents.—C. O. FISHER, Helena, California.

DOES THE MOUNTAIN LION SCREAM?

Does the mountain lion scream? So far as my experience goes I must say no. The grounds upon which I base my opinion are that I have never been able to connect the mountain lion with any screams I have ever heard in the woods.

For a number of years I believed the mountain lion gave screams and hoots, simply because so many old timers told me they did, but on two or three occasions I followed up the sounds and found the mountain lion did not make them.

When I was a boy growing up an old man lived near us, who came to these

parts in the fifties and followed hunting all his life. He claimed to have killed thirty lions, anyway I knew of his killing five or six, and at different times when we were out hunting together, upon hearing these screams, he would say, "Now that is a mountain lion," which he believed to be so. But since, I have followed up the same screams and found them to be made by owls. I myself have never heard the mountain lion make any noise other than a coarse cat-like growling and snarling when angered by dogs.—L. S. DAVEY, Usona, Mariposa County, California.

AN EARLY FLIGHT OF DUCKS.

For several years I have noted a distinct flight of pintailed ducks which arrive in Colusa County from the 1st to the 10th of August. During the day time they feed by thousands in the grain fields, loafing during the middle of the day on the sloughs. Ducks were late in leaving last spring and I had expected that they would be late in arriving this year, but on August 5th they were to be seen by the thousands. Where do they come from? Certainly they are not local birds. Some maintain that this is the first flight of birds from the north and part of a distinct coastal flight. I am inclined to the theory that they may arrive from further south, as a post-nesting season migration. We need more information on this flight of birds and it is to be hoped that increased banding operations will eventually solve the problem.—S. J. CARPENTER, Maxwell, California.

REPORTS.

VIOLATIONS OF FISH AND GAME LAWS.

April 1, 1922, to June 30, 1922.

Offense	Number of arrests	Fines imposed
Game.		
Hunting without a license	3	\$95 00
Hunting on posted grounds	1	10 00
Birds—nongame—possession, killing	2	10 00
Birds (shore)—killdeer: possession	1	25 00
Birds—brant—possession	1	
Deer—possession, killing, closed season	7	250 00
Spiked buck—killing	1	50 00
Does—possession, killing, closed season	1	50 00
Fawn—possession	1	150 00
Deer meat—possession, closed season	8	200 00
Doves—killing, closed season	1	25 00
Ducks (wild)—killing, shipping, over limit, closed season	2	125 00
Rabbits—killing	2	50 00
Quail—possession, killing, out of season	5	155 00
Hides—illegal possession	1	
Taking fur-bearing mammal, closed season	1	
Total game violations	38	\$1,195 00
Fish.		
Angling without a license	6	\$150 00
Blasting fish	1	50 00
Fishing without a license	30	240 00
Fishing in District 2½, closed season	1	25 00
Abalones, undersized, over limit	20	475 00
Barracuda—undersized, possession, selling, illegal	9	475 00
Bass—undersized, possession, over limit, closed season	17	370 00
Clams—undersized, possession, over limit	16	470 00
Crabs—undersized, possession, shipping	9	375 00
Eels (salt water)—undersized, possession	1	20 00
Blue gill—possession, closed season	1	25 00
Lobsters—buying and selling undersized	1	50 00
Perch—possession, closed season	1	20 00
Salmon—selling for profit	1	100 00
Shad—catching with 5-inch gill net	1	
Sturgeon—possession	1	20 00
Trout—closed season, over limit	45	805 00
Using Lampara or beach net (seine) in closed district	6	650 00
Using set line in Sequoia Lake	1	50 00
Possession purse net in District 20	5	250 00
Using nets in American District 1	1	250 00
Taking fish within 150 feet of fishway	1	25 00
Taking striped bass with net less than 5½ inches	2	40 00
Taking trout in fish ladder	1	25 00
Discharging offal in Sacramento River	1	25 00
Failing to register fishing boat and gear	2	
Total fish violations	181	\$4,985 00
Grand total fish and game violations	219	\$6,180 00

SEIZURES.

Game.

Ducks	7	Rabbits	1
Quail	2	Deer	1
Spike buck	8 lbs.	Deer meat (jerkey)	150 lbs.

Fish.

Abalones	120	Salmon	25 lbs.
Bass	27	Salmon	1
Bass	1,035½ lbs.	Shad	56 lbs.
Barracuda	5,375 lbs.	Shad	12
Clams	1,012	Sturgeon	1 box
Crabs	44 sacks	Lobsters	19 lbs.
Crabs	8,423	Lobsters	33
Eels (salt water)	20	Trout	31 lbs.
Oysters	74 lbs.	Trout	261
Perch (salt water)	5 lbs.	Venison (salted)	20 lbs.
Perch (salt water)	33		

Illegal nets	5
Searches	5

STATEMENT OF EXPENDITURES

For the Period January 1, 1922, to March 31, 1922, of the Seventy-third Fiscal Year.

Function	Materials and supplies	Salaries and wages	Service and expense	Property and equipment	Total
Administration:					
Commissioners -----			\$89 98		\$89 98
Executive offices -----	\$96 11	\$4,014 99	1,201 18	\$116 75	5,429 03
Printing -----			921 65		921 65
Research and publicity -----	26 06	1,050 00	238 05	26 75	1,340 86
Department totals -----	\$122 17	\$5,064 99	\$2,450 88	\$143 50	\$7,781 52
Commercial fish culture and conserva- tion:					
Superintendence -----	\$21 01	\$2,406 77	\$1,073 63	\$23 45	\$3,524 89
Inspection and patrol -----	635 58	4,965 00	1,303 15	12 24	6,945 97
Research -----	175 19	4,546 38	442 63	1,970 43	7,134 63
State laboratory construction -----	49 70	185 63	3 35		238 68
Statistics -----	326 10	2,555 15	24 98		2,254 03
Market fishing license commissions -----			89 50		89 50
Salmon propagation and distribution -----	732 97	2,838 33	178 16	30 06	3,779 52
Department totals -----	\$1,318 35	\$17,497 26	\$3,115 43	\$2,036 18	\$23,967 22
Sporting fish culture and conservation:					
Superintendence -----	\$57 00	\$2,850 00	\$4,810 26		\$7,717 26
General patrol (40 per cent) -----	212 58	12,394 34	7,143 00	3 95	19,753 87
Trout propagation and distribution -----	3,008 03	12,337 00	1,495 18	53 23	16,893 44
Department totals -----	\$3,277 61	\$27,581 34	\$13,448 44	\$57 18	\$44,364 57
Game conservation:					
General patrol (60 per cent) -----	\$318 92	\$18,881 53	\$20,588 28	\$5 93	\$39,794 66
Tahoe camping ground -----			2 70		2 70
Grand totals -----	\$5,037 05	\$69,025 12	\$39,605 71	\$2,242 79	\$115,910 67

[illegible]

All amounts shown in pounds unless otherwise specified. Albacore and Skipjack cleaned

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